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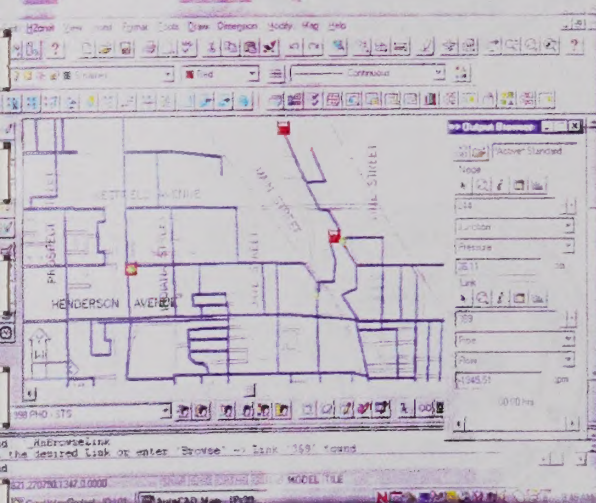
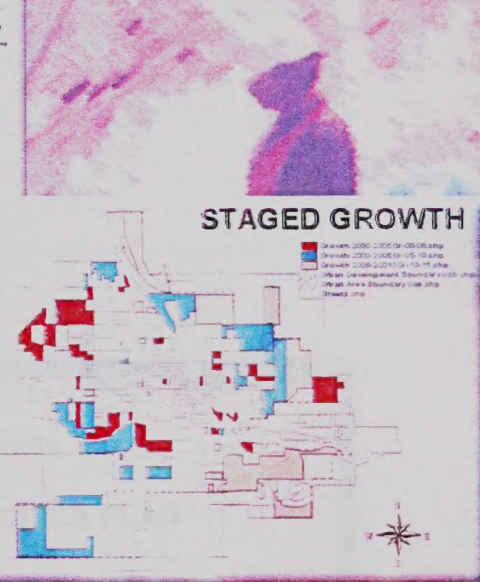
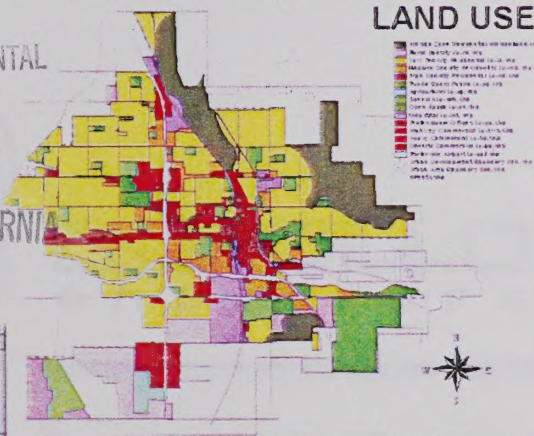


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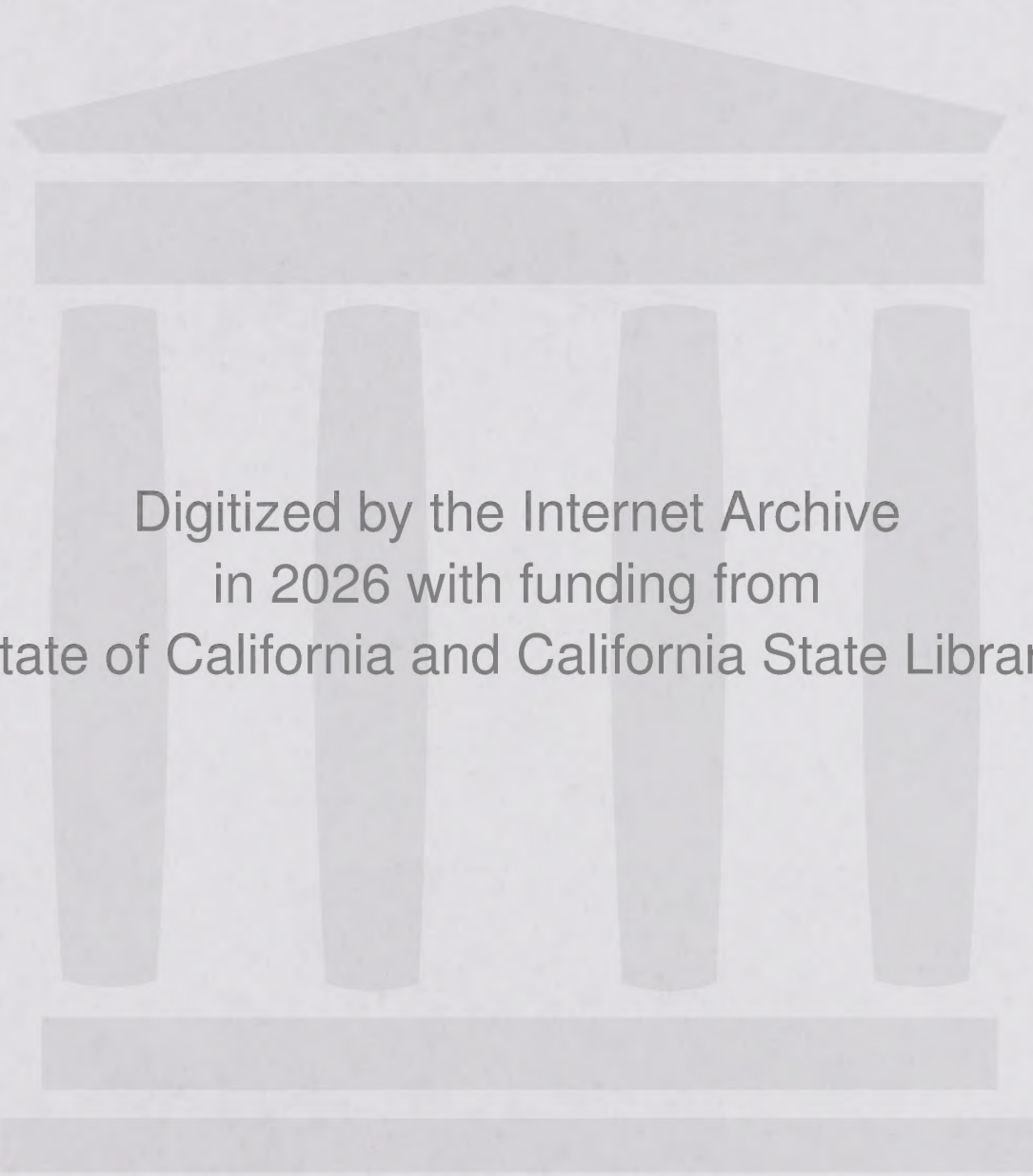
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CAROLLO
engineers



City of Porterville

WATER SYSTEM MASTER PLAN

Final Report

February 2001



*Dedicated to creative,
responsive, quality solutions
for those we serve.*

February 20, 2001

4581B.00

Baldo Rodriguez, Principal Civil Engineer
City of Porterville
291 N Main St.
Porterville, CA 93285

Subject: Water System Master Plan Update - Final Report

Dear Mr. Rodriguez:

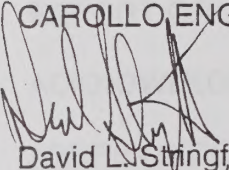
We are pleased to submit the final report for the City of Porterville Water System Master Plan Update. The report presents master planning assumptions, existing water distribution system evaluation, recommended facility improvements, and a capital improvement program to the planning horizon year 2015. This master plan update incorporates the proposed Hillside Residential Land Use Category. The report is organized as follows:

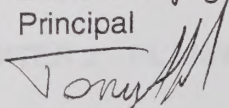
- Chapter 1 - Introduction
- Chapter 2 - Planning Area Characteristics
- Chapter 3 - Planning and Design Criteria
- Chapter 4 - Existing Water System and Hydraulic Model
- Chapter 5 - Water System Evaluation and Proposed Facilities Improvements
- Chapter 6 - Capital Improvement Program

We would like to extend our thanks to you, Hal Hill, Michael Unser, Michael Reed, Richard Bartlett, Ron Mauck, and other City staff whose courtesy and cooperation were valuable components in completing this study and producing this final report.

Sincerely,

CAROLLO ENGINEERS, P.C.


David L. Stringfield, P.E.
Principal


Tony Akel, P.E.
DLS/TAA:cjp

Enclosure: Final Report

City of Porterville
WATER SYSTEM MASTER PLAN
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Executive Summary

WATER SYSTEM MASTER PLAN

The City of Porterville recognizes the importance of providing reliable and efficient water service to its existing customers as well as to future developments. On December 4, 1997, the City authorized Carollo Engineers to prepare a Water System Master Plan that evaluates the existing water system and recommends necessary system improvements to meet water supply and distribution requirements through the year 2015. The findings and recommendations of this study, as summarized in this report, will assist City staff in planning, developing and financing the required water facilities in a timely cost-effective manner. The preparation of the Water System Master Plan has been coordinated with the preparation of the Sewer System Master Plan, which was concurrently completed by Carollo Engineers.

1.0 BACKGROUND AND PURPOSE

The City of Porterville relies solely on groundwater for supplying municipal water to its residents. A series of groundwater wells extract water from the aquifers underlying the City and pump it into the distribution system. In 1997, the City pumped over 4.1 billion gallons of water, serving a population of over 35,000. Previous studies related to this master plan include the 1989 Water System Master Plan

This Water System Master Plan provides the City of Porterville with a tool for planning its water supply through the year 2015. The study address the following tasks:

- Evaluation of the existing water supply and distribution system, using computer hydraulic modeling techniques.
- Determination of existing deficiencies and proposing improvements to enhance system reliability.
- Recommendations for improvements needed to service anticipated future growth, within the Urban Development Boundary.
- Performance of a system-wide supply and storage analysis through the planning horizon year.
- Developing a Capital Improvement Program (CIP) with a horizon year of 2015.
- Performing a water connection fees analysis based on a review of the constructed 1989 Master Plan facilities, and on the needed CIP costs through the year 2015.
- Training City staff on the use of the water hydraulic model.

2.0 PLANNING AREA AND GROWTH TRENDS

The planning area for this master plan coincides with the City's Urban Development Boundary (Figure ES.1). The area is generally bounded by W. North Grand Avenue to the north, the Friant-Kern Canal to the northwest, Teapot Dome Avenue and the Porterville Airport on the southwest, Scranton Avenue and the Porterville Development Center on the southeast, and Hillcrest Street and Reid Avenue on the northeast. The planning area also includes a strip of land north of W. North Grand Avenue and east of Highway 65.

From 1970 to 1996, the City experienced growth rates which ranged from 0.40 to 11.54 percent, with an annual average of 3.88 percent. The City's historical growth rates are identical to other San Joaquin Valley cities' historical growth rates, which typically average 3.0 percent per year. Population projections presented in the City's 1994 General Plan, which reflect a growth rate of 3.5 percent through the planning horizon year of 2010, were adopted for this master plan.

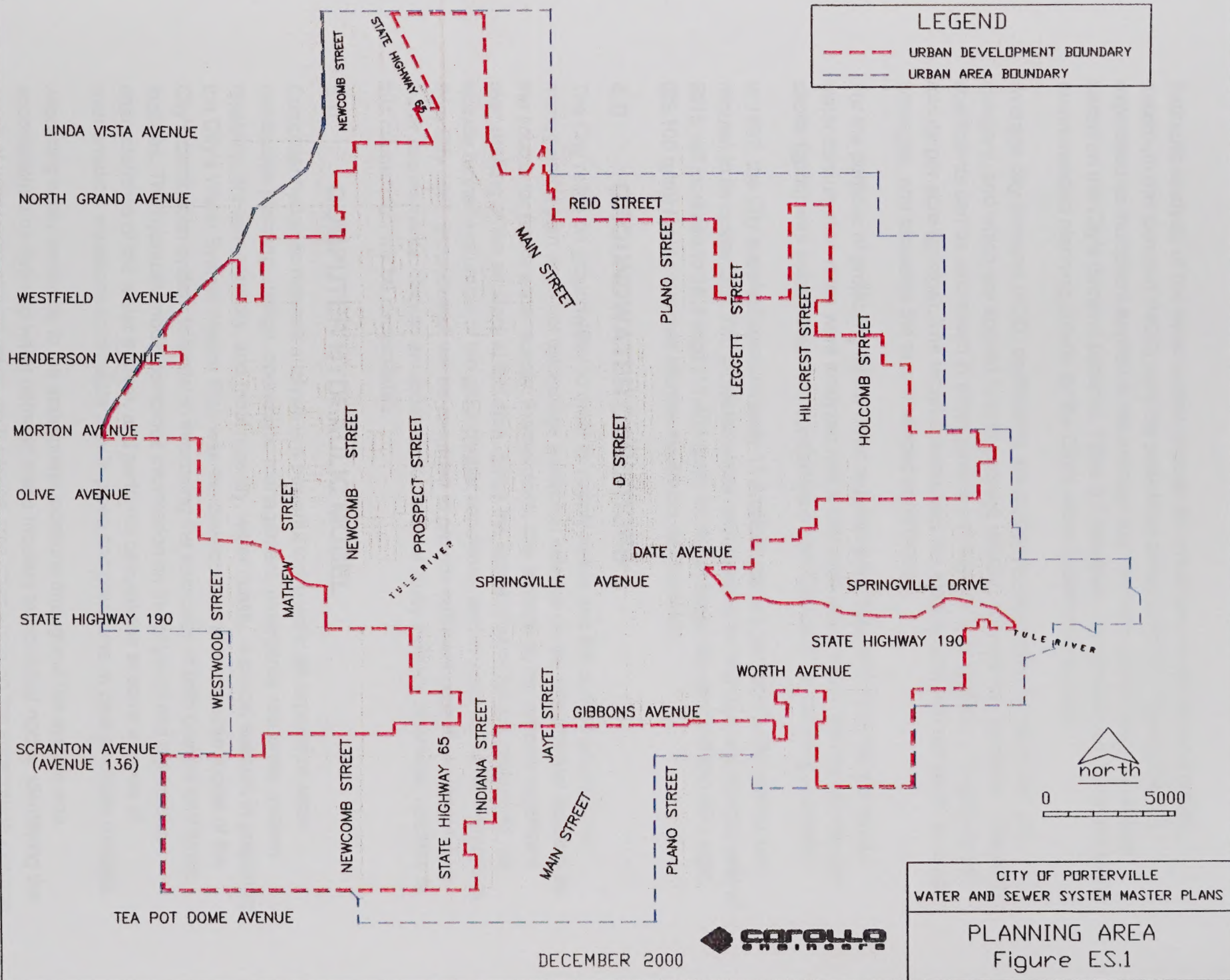
The City's planning department provided assistance in the development of a 5-year incrementally staged growth plan through the planning horizon year of 2015. Population and staged growth projections provided guidance for this Master Plan to forecast future water requirements and the staging of future water system improvements. Should growth trends change in the future, the recommendations of this Master Plan may need to be adjusted accordingly.

3.0 PLANNING CRITERIA AND WATER REQUIREMENTS

Water system master planning requires the development of design criteria in order to define existing system capacities. The water system was evaluated based on water supply capacity, storage capacity, service pressures, and the performance of distribution mains. Historical water consumption and production records were analyzed to determine daily, monthly, and seasonal fluctuations experienced by the City water system.

Ideally, a water distribution system should be operated at a constant water-supply rate with consistent supply from water-sources. On the day of maximum demand, it is desirable to maintain a water supply rate equal to the maximum day demand rate. Water required for peak hour demands or for fire flows would come from either of: 1) storage, 2) additional supply capacity (wells), or 3) combination of storage and additional supply capacity. It is also essential that the water pressure in a water system be neither too high nor too low. Low pressures (below 30 psi) can cause annoying flow reductions when more than one water-using appliance is used. High pressures may cause faucets to leak and valve seats to wear out quickly. Additionally, high service pressures usually result in higher utility bills and wasted water.

Peaking factors represent the increase above average annual water demand, experienced during a specified time period. Peaking conditions that are of particular significance to



hydraulic analysis of the water system include the maximum month demand (MMD), maximum day demand (MDD), and the peak hour demand (PHD). Peaking factors, expressed as multipliers applied to the average day demands (ADD), were developed based on the City's demand patterns. Table 3.5 provides a comprehensive summary of the recommended planning criteria for the City's water system master plan.

Average day demand (ADD) coefficients are multipliers developed for each land use category, and which are applied to land acreage yielding average day demands. The ADD coefficients can be expressed in either gallons per day per acre (gpdpa) or in gallons per minute per acre (gmpa). The report summarizes the existing and planned future land use acreages, and tabulates the recommended coefficients.

For the purpose of projecting future water requirements, the City's historical per-capita water consumption rates were analyzed and a City-wide value of 250 gallons per day per capita (gpcd) was established, with concurrence from City staff, for planning purposes.

In 1997, the City supplied approximately 11.4 million gallons per day (7,900 gallons per minute) to its customers. The projected water requirements for the planning horizon year of 2015 will increase to 16.4 mgd (11,400 gpm) for the average day demand and 36.1 mgd (25,100 gpm) for the summer months maximum day demand.

4.0 GROUNDWATER CONDITIONS

The City relies on groundwater to meet its supply needs and the current groundwater management plan does not discourage additional reliance on the groundwater aquifers as the source for future water supply. Furthermore, City records do not indicate significant over drafting of the aquifers at this time. Since the scope of work for this project did not include further evaluation of the groundwater conditions, and in accordance with directions from City staff, groundwater will be assumed to provide sufficient capacity to meet future water requirements. Should an updated groundwater study indicate otherwise, updates to this master plan will be necessitated.

5.0 COMPUTER HYDRAULIC MODEL

Computer hydraulic network analysis is a powerful tool used in all aspects of water distribution planning, design, operations, management, emergency response, system reliability, fire-flow capacity, and most recently, water quality. A critical element in preparing the City's Water System Master Plan was the development of a computer model of the City's distribution system to assist in evaluating the adequacy of both present and future facilities. The hydraulic model combines information on the physical and operational characteristics of the water system, and performs calculations to solve a series of mathematical equations to simulate flow in pipes and pressures at pipe junctions (nodes).

Allocating water demands to the appropriate locations throughout the system was accomplished by defining water demand areas tributary to individual nodes, identifying the areas of water user groups within each service area, then applying the appropriate average

day demand coefficients to each water user group in those areas. The computer hydraulic model was then calibrated to establish a level of confidence in the pressures and flows that were simulated. The calibrated model serves as an established benchmark for further analysis and evaluation.

6.0 RECOMMENDATIONS

The recommendations discussed in the report, include supply requirements, storage requirements, and distribution system improvements.

Supply Requirements

The City's current supply capacity of 13,860 gpm almost meets the maximum day demand of 14,000 gpm, provided that all wells are in service and operating. However, the planning and design criteria established for the supply capacity dictates providing for an additional 3,000 gpm standby capacity, for a total source of supply requirement for 1998 of 17,000 gpm. In order to mitigate the current production deficiency, it is recommended the additional supply be increased. As previously discussed, and for the purpose of this master plan, additional groundwater wells with an average capacity of 1,000 gpm, will be used to meet future supply requirements. As the actual well production may vary depending on yield of the selected site, the number of future wells may need to be adjusted accordingly.

Thus, it is recommended that five new wells (1,000 gpm each) be constructed to mitigate the current supply deficiency. Future water requirements will necessitate the addition of two wells during the period from 2001 to 2005, four new wells between the period 2006-2010, and four new wells between the period 2011-2015.

Storage Requirements

Storage requirements are based on operational, emergency, and fire fighting needs. Currently, the City's water storage capacity of 6.35 MG is sufficient to meet the storage needs through the year 2002. A variety of sizing and construction timing alternatives could be considered to meet future storage requirements.

City staff, in anticipating the need for future storage requirements, have completed the acquisition of an elevated storage site on Martin Hill, and have also completed the design for a 3 MG tank on the site. The addition of the Martin Hill tank will meet storage needs through the year 2014.

To meet daily operational water requirements and to provide adequate and reliable fire protection in the elevated existing and proposed pressure zones, the following storage reservoirs are recommended.

- 0.30 MG Upper Scenic Heights Tank (replacement to existing 0.05 MG Upper Scenic Heights Tank)
- 0.35 MG Rocky Hill Pressure Zone 1

- 0.25 MG Rocky Hill Pressure Zone 2
- 0.25 MG Rocky Hill Pressure Zone 3
- 0.25 MG North Pressure Zone

Emergency Supply Capacity

The City's production is completely dependent on its wells. In the event of a power outage, the only available City water supply is the water stored in the existing storage tanks that can flow by gravity to pressurize the water system. Criteria established in this report is consistent with industry standard practice and require a supply capacity during emergency conditions to provide 50 percent of the maximum day demand.

It is therefore recommended that four (4) new emergency generators be purchased and installed at four of the largest producing wells, which include Well nos. C-17, C-20, C-22, C-24, or C-25. Assuming that the future supply source will continue to be additional groundwater wells, it is recommended that the City purchases a new emergency generator at every fourth well constructed. Future Stored water can provide the city with 25 percent of maximum day demand. The remaining (25) percent must be met with supply wells equipped with power generators.

Distribution System Improvements

Based on the computer analysis and the established evaluation criteria, deficiencies in the existing distribution system were identified and described by pressure zone. The growth and expansion of the City will also require new distribution mains to serve the new developments. Improvements were planned based on the growth staging identified by City staff, and assumed to extend along the alignment of existing streets right-of-ways. Improvements recommended for enhancing system operation and reliability are described in detail in this report, and quantified in the capital improvement program.

7.0 CAPITAL IMPROVEMENT PROGRAM

The cost estimates presented in the Capital Improvement Program have been prepared for general master planning purposes and for guidance in project evaluation and implementation. Final costs of projects will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule, and other variable factors such as: preliminary alignments generation, investigation of alternative routings, and detailed utility and topography surveys.

Knowledge about site-specific conditions for each proposed project is limited at the master planning stage, therefore the Estimated Construction Costs include a 15 percent contingency to account for unforeseen events and unknown field conditions. The Capital Improvement Costs also include an additional 15 percent (applied to the Estimated Construction costs) for project-related costs, comprising of engineering, administration, construction inspection, and legal costs.

The Capital Improvement Program (CIP) Costs for facilities required to correct existing deficiencies have been separated from those required to service anticipated future expansion areas, as follows:

• Improvements to Correct Existing Deficiencies	\$5,762,000
• Expansion Improvements (2000-2005)	\$6,843,000
• Expansion Improvements (2005-2010)	\$7,007,000
• Expansion Improvements (2010-2015)	\$6,433,000

8.0 CONNECTION FEES ANALYSIS

Connection fees are charges imposed by the City on new developments, for recovering the costs of public facilities needed to service those developments. In order to continue to meet the intent of Assembly Bill 1600 (AB 1600), the scope of work for this project included an analysis and update of the costs of the 1989 Master Plan improvements which have been built. Following the review of the constructed projects' "as-built" drawings and associated costs, the resulting adjustment was incorporated into the recommended connection fee analysis. This analysis determined that a rate increase to the connection fees is not necessary at this time. The current rates are:

• Hillside	\$1,000 per acre
• R-1	\$2,130 per acre
• R-2	\$5,332 per acre
• R-3 & R-4	\$12,448 per acre
• Institutional	\$1,389 per acre
• Commercial	\$1,600 per acre
• Industrial	\$12,294 per acre

9.0 SUMMARY

Using hydraulic computer modeling, the City's water system was evaluated for water supply capacity, storage capacity, service pressures, and the performance of the distribution system.

The evaluation has identified areas of the water system that need improvements in supply and distribution to meet current, as well as future (year 2015), demand conditions. The improvements were prioritized and their cost estimated and included in the Capital Improvement Program.

Chapter 1

INTRODUCTION

This chapter presents a brief background of the City's water system, the need for this water system master plan, and the objectives of the study. A list of abbreviations is also provided to assist the reader in understanding the information presented in this report.

1.0 BACKGROUND

The City of Porterville is currently experiencing moderate population and industry growth. Recognizing the importance of planning, developing, and financing water system facilities to provide reliable service for existing customers and to serve anticipated growth, the City initiated the preparation of this water master plan.

At present, the City relies solely on groundwater for supplying municipal water to its residents. A series of groundwater wells, generally scattered west of Plano Avenue and south of Grand Avenue, extract water from the aquifers underlying the City and pump it into the distribution system.

In 1997, the City pumped over 4.1 billion gallons of water and served a population of over 35,000. Previous studies relevant to this master plan include the 1989 Water System Master Plan, and the City's 1990 Urban Water Management Plan.

2.0 AUTHORIZATION AND SCOPE

On December 4, 1997, the City authorized Carollo Engineers to prepare a water system master plan that evaluates the existing water distribution system, provides recommended improvements, and develops a Capital Improvement Program.

The water system master plan provides the City of Porterville with a tool for planning the water infrastructure facilities through the projected horizon year of 2015. If planning conditions change, and depending on their magnitude, adjustments to the master plan recommendations might be necessary.

This report addresses the following tasks:

- Evaluation of the existing water supply and distribution system, using computer hydraulic modeling techniques.
- Determination of existing system deficiencies and proposing improvement to enhance system reliability.
- Recommendations of improvements needed to service anticipated future growth, within the Urban Development Boundary.
- Performing of a system-wide supply and storage analysis through the planning horizon year.

- Developing a Capital Improvement Program with a planning horizon year of 2015.
- Performing a water rate analysis based on a review of the constructed 1989 Master Plan facilities.
- Training City staff on the use of the hydraulic model.

3.0 REPORT ORGANIZATION

The Water System Master Plan report contains six chapters, followed by appendices that provide supporting documentation for the information presented in this report. The chapters are briefly described below.

Chapter 1 - Introduction presents a brief background of the City's water system, the need for this Water System Master Plan, and the objectives of the study. A list of abbreviations is also provided to assist the reader in understanding the presented information.

Chapter 2 - Planning Area Characteristics defines the study area of the master plan, provides a summary of land use categories within the Urban Development Boundary (UDB), presents potential trends for future growth, and lists historical as well as projected population within the UDB. The projections of future land use trends and population growth was performed to estimate future water requirements.

Chapter 3 - Planning and Design Criteria included in this chapter served as a guide for evaluating Porterville's water system. The criteria include the water supply capacity, storage capacity, acceptable service pressures, distribution mains performance, average annual water demand coefficients, and daily and hourly peaking factors.

Chapter 4 - Existing Water System and Hydraulic Model describes the existing water system and the hydraulic water model assembled for evaluating the distribution system. Discussion of the major water supply and distribution system components are provided. This chapter also presents the results of the calibration effort which was performed to establish a level of confidence in the City's hydraulic model.

Chapter 5 - Water System Evaluation and Proposed Facilities Improvements identifies existing water use and develops future water supply and storage requirements based on the population projections, potential growth, and land use, as presented in a previous chapter. This chapter also presents improvements to mitigate existing system deficiencies and for expansion of the future water system. These improvements are recommended based on the system's technical requirements, cost effectiveness, and operational reliability.

Chapter 6 - Capital Improvement Program presents the recommended Capital Improvement Program (CIP) for the City of Porterville water distribution system. The program is based on the evaluation and on the recommended water facility projects. The CIP has been staged to the planning horizon year 2015.

4.0 ACKNOWLEDGMENTS

Carollo Engineers wishes to acknowledge and thank Mr. Michael Unser, Community Development and Services Director; Mr. Harold Hill, City Engineer; Mr. Baldomero Rodriguez, Principal Civil Engineer and Project Manager; Mr. Michael Reed, Assistant Engineer; Mr. Richard Bartlett, Water Utility Superintendent; and Ron Mauck, Planning Director. Their own and their staff's cooperation and courtesy in obtaining the variety of necessary information were valuable components in completing and producing this report.

5.0 ABBREVIATIONS AND DEFINITIONS

To conserve space and to improve readability, the following abbreviations are used in this report.

ADD	average day demand
AF	acre-feet
CIP	capital improvement program
City	City of Porterville
cfs	cubic feet per second
DI	ductile iron
ENR	Engineering News Records Construction Cost Index
EPA	U.S. Environmental Protection Agency
EPANET	water distribution system hydraulic model developed by EPA
GIS	geographic information system
gpm	gallons per minute
gpd	gallons per day
gpdc	gallons per day per capita
HGL	hydraulic grade line
HP	horsepower
ISO	Insurance Service Office
kWh/AF	kilowatt hours per acre-feet
LF	linear feet
MCL	maximum contaminant level
MDD	maximum day demand
MG	million gallons
MMD	maximum month demand
MSL	mean sea level
mgd	million gallons per day
mg/L	milligrams per liter
PHD	peak hour demand
ppb	parts per billion
psi	pounds per square inch
SCADA	Supervisory Control and Data Acquisition
SCE	Southern California Edison
SOI	sphere of influence
sq.ft.	square feet
TDH	total dynamic head
UAB	Urban Area Boundary
UDB	Urban Development Boundary

Chapter 2

PLANNING AREA CHARACTERISTICS

This chapter defines the study area of the master plan, provides a summary of land use categories within the Urban Development Boundary (UDB), presents potential trends for future growth, and lists historical as well as projected population within the UDB. Population projections, as used in this master plan, provide guidance for forecasting water requirements and for staging future water system improvements.

1.0 PLANNING AREA

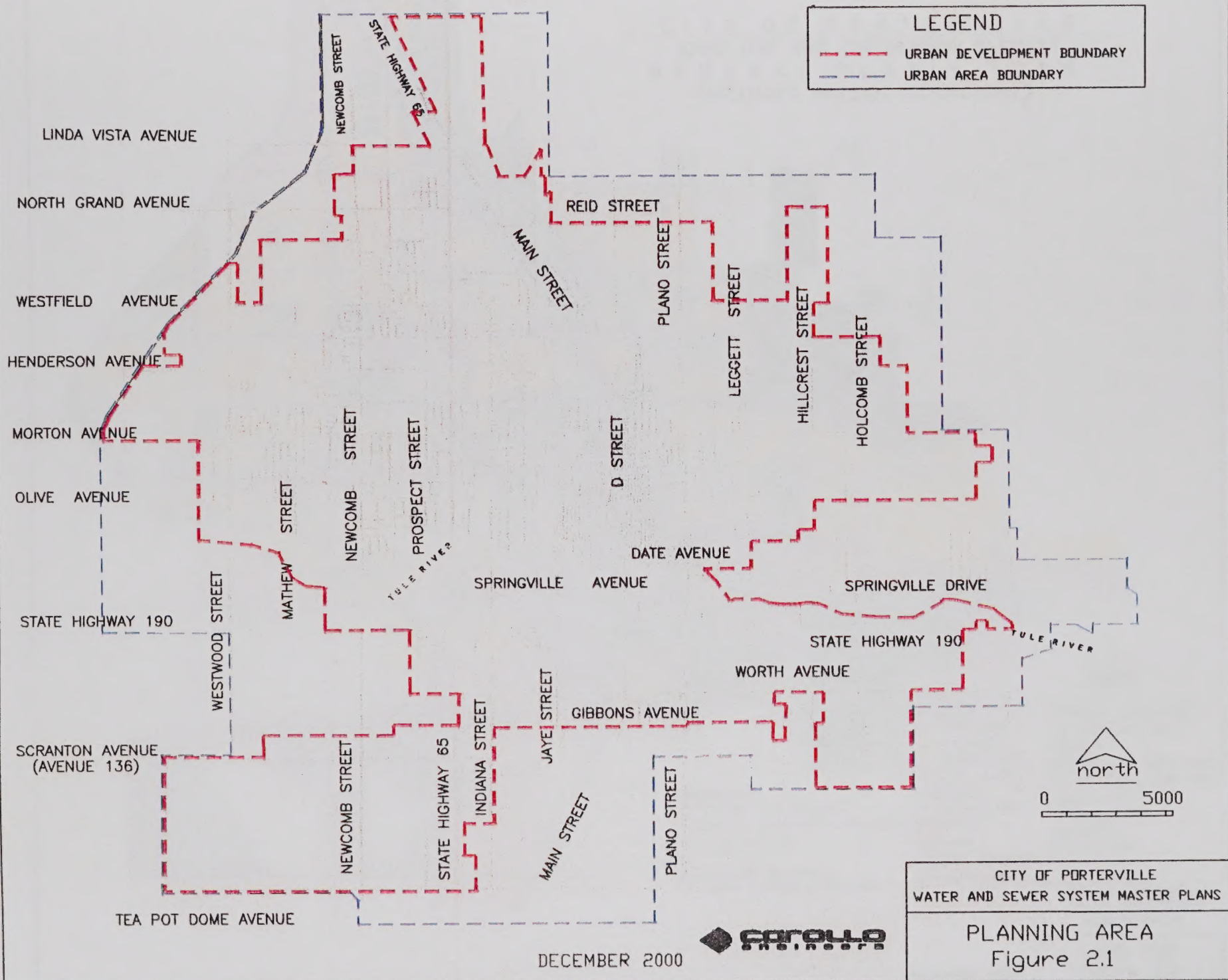
The planning area for this master plan coincides with the City's Urban Development Boundary, as shown on Figure 2.1. The area is generally bounded by W. North Grand Avenue on the north, the Friant-Kern Canal on the northwest, Teapot Dome Avenue and the Porterville Airport on the southwest, Scranton Avenue and the Porterville Development Center on the southeast, and Hillcrest Street and Reid Avenue on the northeast. The planning area also includes a strip of land north of W. North Grand Avenue and east of Highway 65.

The City's location at the base of the Sierra Nevada Foothills results in a more varied topography than is common in most other Valley communities. The elevations of the Valley floor portions of the City planning area ranges between 470 feet above mean sea level (MSL) in the northeast and 420 feet MSL in the northwest. The approximate downward slope, from the eastern area of the City to the western area, is two (2) percent. The northerly and northeastern portions of the planning area, feature rolling and hilly land forms rising to approximately 1,028 feet MSL at Lewis Hills.

The planning area is bisected by Highway 65 in a north-south direction, and by Highway 190 in an east-west direction. The Tule River conveys water from Lake Success, which is located at approximately 2 miles east of the planning area's easterly boundary, and meanders through the City in a westerly direction.

2.0 LAND USE

The land use classifications used in this master plan are consistent with the Land Use, Open Space, and Conservation elements of the General Plan report, dated April 1994 (Figure 2.2). It should be noted that the Hillside Zone Residential Category was added in the 2000 master plan update, in accordance with directions from City Planning staff. In Porterville, the average City-wide residential household population has typically been around 3.0 persons per dwelling unit.



CITY OF PORTERVILLE
LAND USE AND CIRCULATION ELEMENT
GENERAL PLAN - 1996
(INCLUDES HILLSIDE RESIDENTIAL)

LEGEND:

RESIDENTIAL

- RURAL DENSITY
- LOW DENSITY
- MEDIUM DENSITY
- HIGH DENSITY

COMMERCIAL

- NEIGHBORHOOD
- GENERAL
- HEAVY
- PROFESSIONAL/OFFICE
- HIGHWAY COMMERCIAL

BOUNDARIES

- URBAN AREA BOUNDARY
- URBAN DEVELOPMENT BOUNDARY
- CITY LIMIT LINE
- HILLSIDE RESIDENTIAL

PUBLIC & QU

- RECREATION AND SCHOOLS
- PUBLIC AND RECREATION
- AGRICULTURE
- INDUSTRIAL

CITY OF PORTERVILLE
WATER

CITY OF PORTERVILLE
WATER AND SEWER
MASTER PLANS

LAND USE
Figure 2.2

November 2000

Hillside Residential (HR)

The Hillside Residential density was incorporated in this 2000 master plan update in accordance with directions from City Planning staff. This HR designation, which allows for up to one residential dwelling unit per 3 gross acres, is intended for single family housing in the hillside. Full community level services (i.e., water, sewer, fire protection, etc.) shall be available to this category.

Rural Density Residential (RD)

The Rural Density Residential designation, which allows 0-2 residential dwelling units per gross acre, is intended for large-lot development around the periphery of the community, and as a transition between agricultural/open areas and more intensive urban uses. Full community level services (i.e., water, sewer, fire protection, etc.) shall be available to this category.

Low Density Residential (LD)

The Low Density Residential designation, which allows 2-7 residential dwelling units per gross acre, is intended to provide for the development of single family housing, and planned residential developments. Full community level services (i.e., water, sewer, fire protection, etc.) shall be available to this category, as well as to more intensive land use categories.

Medium Density Residential (MD)

The Medium Density Residential designation, which allow for 7-15 residential dwelling units per gross acre, is intended for multi-family affordable housing, generally located on arterial and collector streets.

High Density Residential (HD)

The High Density Residential designation, which allows for 15-43 residential dwelling units per gross acre, is intended to enable residential development of parcels and sites that cannot reasonably be developed to other more appropriate uses because of location, configuration, or other unique conditions.

Commercial (NC, GC, HC, HWYC, and PO)

The Commercial designation includes the City's five commercial categories accommodating the miscellaneous levels of services needed in the City: Neighborhood Commercial (NC), General Commercial (GC), Heavy Commercial (HC), Highway Commercial (HWYC), and Professional Offices (PO).

Industrial (IND)

The Industrial designation provides for the development of a variety of manufacturing, assembly, processing, and packaging uses.

Public and Quasi Public (PQ)

The Public and Quasi Public designation accommodates non-recreational government, schools and other public facilities, such as cemeteries, drainage basins and hospitals.

Recreation and Open Space (OS)

The Recreation and Open Space designation includes the City's parks, landscaped and scenic areas, and permanent open space.

Agriculture (AG)

The Agriculture designation is applied within the planning area to sustain agricultural utilization of properties upon which urban development in the foreseeable future is not anticipated.

Special Categories (PAT, SCH)

These designations are specific to this master plan, and are intended to single out either large water/sewer users, or large areas with very low water/sewer usage. These designations include the Porterville Airport (PAT), and lands used for public and private schools (SCH). Water demand and sewer flows from these areas will be modeled based on actual metered data, when available.

3.0 POPULATION AND STAGED GROWTH

Porterville's historical population figures were obtained from the City records and are presented in Table 2.1. From 1970 to 1996, annual population growth has ranged between a low of 0.40 percent in 1987 to a high of 11.54 percent in 1979, with an average annual growth rate over that 28-year period of 3.88 percent. The last 10-year and 5-year average annual growth rates have dropped to 3.48 percent and 2.36 percent, respectively. Porterville's historical population growth rates are identical to San Joaquin Valley cities' historical growth rates, which typically average at approximately 3.0 percent per year. Population projections presented in the City's 1994 General Plan report reflect the assumption that population increases would occur at a rate of 3.5 percent per year through the year 2010.

The City's planning department provided assistance in developing a 5-year increment staged growth plan through the planning horizon year of 2015 (Figure 2.3). Population projections and staged growth, as used in this master plan, provide guidance for forecasting water requirements and for staging future water system improvements. Should growth trends change in the future, the recommendations of this Master Plan may need to be adjusted accordingly.

**Table 2.1 Historical and Projected Population
City of Porterville Water System Master Plan**

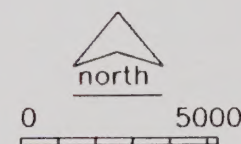
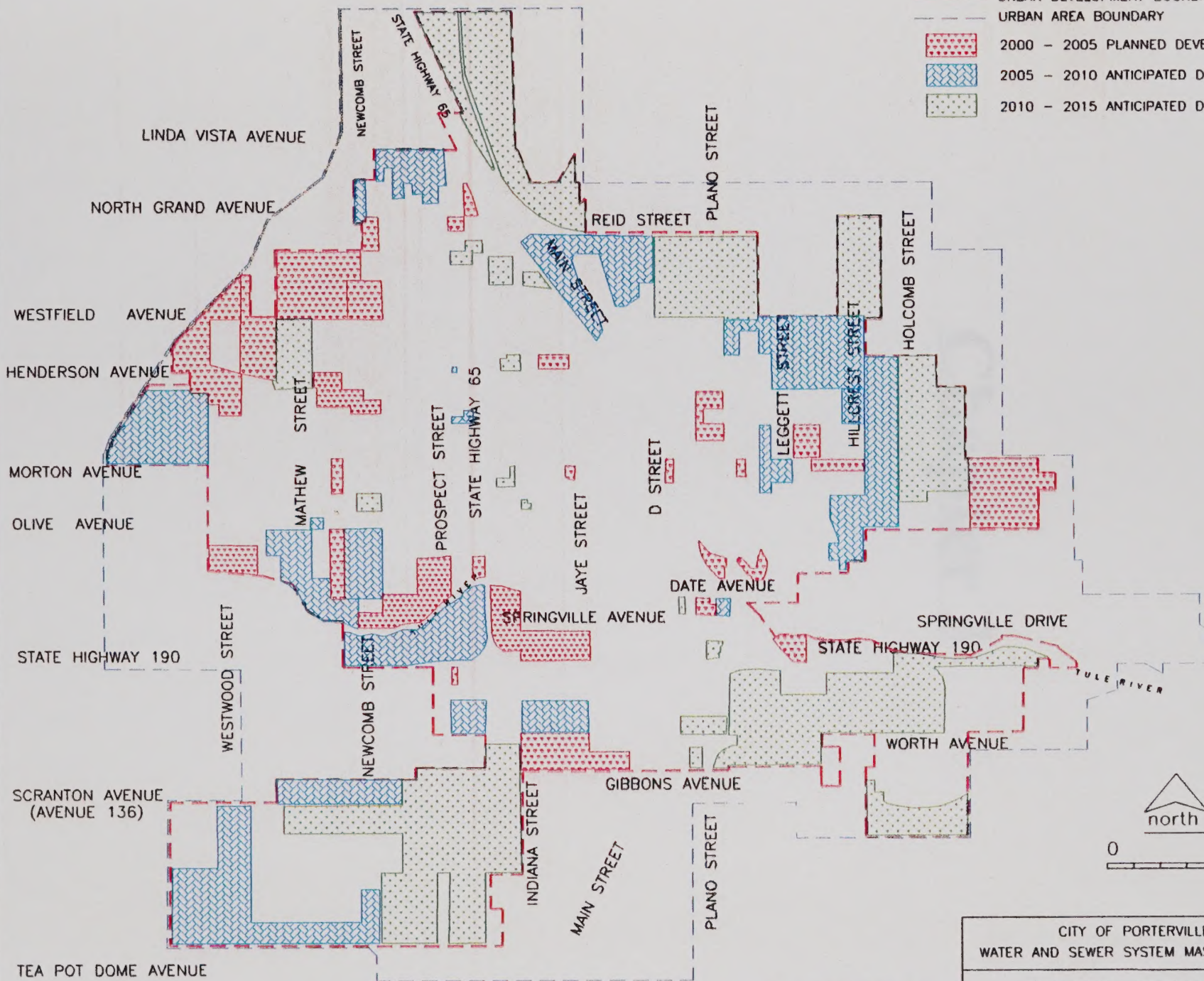
Year	Population	Annual Growth Rate (percent)	Historical and Projected Growth Rates (percent)	
1970	12,602			
1971	12,900	2.36%		
1972	13,188	2.23%		
1973	13,730	4.11%		
1974	14,350	4.52%		
1975	14,900	3.83%		
1976	15,900	6.71%		
1977	16,200	1.89%		
1978	16,406	1.27%		
1979	18,300	11.54%		
1980	19,707	7.69%	Historical 20-year average 4.03% Historical 10-year average 3.48% Historical 5-year average 2.36%	
1981	20,793	5.51%		
1982	21,895	5.30%		
1983	22,611	3.27%		
1984	23,271	2.92%		
1985	24,002	3.14%		
1986	24,516	2.14%		
1987	24,614	0.40%		
1988	25,071	1.86%		
1989	26,981	7.62%		
1990	28,839	6.89%	Historical 28-year average 3.88%	
1991	30,380	5.34%		
1992	31,547	3.84%		
1993	32,840	4.10%		
1994	33,803	2.93%		
1995	33,636	-0.49%		
1996	34,581	2.81%		
1997	35,428	2.45%		
1998	36,668	3.50%		
1999	37,951	3.50%		
2000	39,280	3.50%	Projected 3.50%	
2001	40,654	3.50%		
2002	42,077	3.50%		
2003	43,550	3.50%		
2004	45,074	3.50%		
2005	46,652	3.50%		
2006	48,285	3.50%		
2007	49,975	3.50%		
2008	51,724	3.50%		
2009	53,534	3.50%		
2010	55,408	3.50%		
2011	57,347	3.50%		
2012	59,354	3.50%		
2013	61,432	3.50%		
2014	63,582	3.50%		
2015	65,807	3.50%		

Sources:

1. 1970 to 1990 population: Federal Census of Housing and Population.
2. 1991 to 1997 population: State of California Department of Finance, Population Research Unit.
3. 1998 to 2015 population: projected at an annual growth rate of 3.5%, in accordance with the General Plan.

LEGEND

- URBAN DEVELOPMENT BOUNDARY
- URBAN AREA BOUNDARY
- 2000 - 2005 PLANNED DEVELOPMENT
- 2005 - 2010 ANTICIPATED DEVELOPMENT
- 2010 - 2015 ANTICIPATED DEVELOPMENT



CITY OF PORTERVILLE
WATER AND SEWER SYSTEM MASTER PLANS

STAGED GROWTH
Figure 2.3

Chapter 3

PLANNING AND DESIGN CRITERIA

Porterville's water system was evaluated based on the analysis and design criteria defined in this chapter. Historical water consumption and production records were reviewed and analyzed to determine daily, monthly and seasonal fluctuations experienced by the Porterville water system. The developed criteria addresses the water supply capacity, storage capacity, acceptable service pressures, distribution mains performance, average annual water demand coefficients, and daily and hourly peaking factors.

1.0 WATER SUPPLY CAPACITY

In determining the adequacy of the water supply facilities, the source must be large enough to meet the varying water demand conditions, as well as provide sufficient water during potential emergencies such as power outages and natural or created disasters.

Normal Production Capacity

Ideally, a water distribution system should be operated at a constant water-supply rate with consistent supply from water-source pumps at the wells. On the day of maximum demand, it is desirable to maintain a water supply rate equal to the maximum day demand rate. Water required for peak hour demands or for fire flows would come from either of: 1) storage, 2) additional well capacities, or 3) combination of storage and additional well capacities. Porterville's proximity to the base of the Sierra Nevada Foothills provides a desirable topography for fully incorporating water storage reservoirs to satisfy fluctuations in excess of the maximum day water demand conditions.

Standby Production Capacity

Standby production capacity is required for system reliability. Under normal operating conditions, it is possible that one or two of the City's wells can be placed out of service during maximum day demand conditions due to equipment malfunction for servicing, or for water quality concerns. To mitigate the impact of lost production capabilities, the City should have two to three standby wells, in surplus of the maximum day demand requirements. It is recommended that standby production for Porterville be equivalent to two or three wells with a total production capacity of 3,000 gpm.

Therefore, the adequate source of supply for Porterville will consist of groundwater wells with a combined production capacity that continues to meet the maximum day demand, in addition to standby wells that have a total production capacity of 3,000 gpm.

2.0 STORAGE CAPACITY

The principle function of storage is to provide reserve supply of water for: 1) operational equalization, 2) fire reserve, and 3) emergency needs. Operational storage is directly related to the amount of water necessary to meet peak demands. The intent of operational

storage is to provide the difference in quantity between the customer's peak demands and the system's reliable available supply. The volume of water allocated for emergency uses is based on the historical record of emergencies experienced, and on the amount of time which is expected to lapse before a hypothetical problem can be corrected.

Operational Storage

This storage is the amount of desirable stored water in a system to regulate fluctuations in demand so that extreme variations will not be imposed on the source of supply. Since the peak demand could be as much as 3.5 times the average demand, providing supply for that demand without storage would require 3.5 times the supply source capacity. With operational storage, system pressures are improved and stabilized to better serve customers throughout the service area. Operational storage is commonly estimated between 25 percent and 50 percent of the maximum day demand.

Fire Storage

This storage is the amount required when the capacity of the production facilities is insufficient to meet the necessary maximum day demand plus fire flow demands for a certain duration of time. The Insurance Service Office (ISO), a non-profit association of insurers that sets guidelines on which it evaluates the relative insurance risks in communities, recommends the provision of a fire flow rate of 3,500 gpm for a duration of 3 hours. This provision, equated to a storage requirement of 0.63 million gallons, will allow the water system to respond to hypothetical fire in residential, commercial, or industrial areas.

Emergency Storage

This storage is the volume recommended to meet demand during emergency situations such as pipeline failures, major trunk main failures, pump failures, electrical power outages, or natural disasters. The amount of emergency storage included within a particular water distribution system is an owner option, based on an assessment of risk, the desired degree of system dependability, economic considerations, and water quality concerns. In California, emergency storage is usually estimated at 50 to 100 percent of the maximum day demand. Based on historical data that point to the rarity of prolonged power outages in California cities, the water stored in the City's underlying groundwater basin offsets the need to store water above ground, provided that pumping methods are reliable.

Total Storage

The minimum recommended operational storage capacity for Porterville is equal to 25 percent of the maximum day water demand. Additionally, the recommended fire storage capacity is 0.63 MG. Emergency storage can be considered available underground, provided that it can be pumped reliably during power outages.

3.0 SERVICE PRESSURES

There are differences in the pressures maintained in distribution systems in various cities. It is essential that the water pressure in a consumer's residence or place of business be neither too high nor too low. Low pressures, below 30 psi, cause annoying flow reductions when more than one water-using appliance is used. High pressures may cause faucets to leak and valve seats to wear out quickly. Additionally, high service pressures usually result in wasted water and high water utility bills. The Uniform Plumbing Code (UPC) requires water pressures not exceed 80 psi at service connections, unless the service is provided with a pressure-reducing device.

Due to the relatively flat topography in the central and west pressure zones of Porterville, it is recommended that the maximum pressure criteria during static conditions be set between 55 psi and 65 psi, and the minimum pressure criteria during maximum day conditions be set at 40 psi. Due to the hilly topography of the east pressure zone, it is recommended that the maximum pressure criteria during static conditions be set at no greater than 80 psi. The minimum acceptable service pressure criteria during peak hour conditions is 35 psi.

Another service pressure criteria is related to fire flows and was devised to ensure adequate positive pressure head for the booster pumps in fire trucks. The fire pressure criteria requires a minimum acceptable residual pressure of 20 psi at the connecting hydrant used for fighting the fire.

4.0 DISTRIBUTION MAINS

Transmission grid mains are generally sized to carry the greater of: 1) the peak hour demand, or 2) the maximum day demand plus fire flow. Other criteria related to the distribution piping include the maximum and minimum velocities and the maximum allowable friction losses.

It is normally good practice to become concerned when pipe velocities exceed 8 fps on a continuous basis. High velocities may cause damage to the pipes and to their appurtenances. Velocities of 10 feet per second (fps), or higher, do not usually cause ill effects if they occur for a limited duration.

As long as the maximum velocity criteria and the pressure criteria are not violated, high head loss by itself is not an important factor. However, it may be a warning that the pipe is nearing the limit of its carrying capacity, and may not have sufficient capacity to perform under stringent conditions. It is normally good practice to monitor pipes that have a head loss in excess of 10 feet per 1,000 feet. The roughness coefficients for calculating head loss in pipes will be based on industry standards for similar pipe materials and service age (Table 3.1).

Table 3.1 Pipe Roughness Coefficients
City of Porterville Water System Master Plan

Pipe Material	Age (Years)						
	0	5	10	20	30	40	50
Asbestos Cement	140	138	136	132	128	124	120
Cast Iron	130	120	111	96	87	80	60
Ductile Iron	130	120	111	96	87	80	60
Plastic (PVC)	150	149	148	146	144	142	140
Steel	125	115	106	91	82	75	65

Notes:

1. Roughness Coefficients are applicable to the Hazen-Williams equation, $V = 1.318 C R^{0.63} S^{0.54}$ Where: V is the velocity (fps), C is the Hazen-Williams Coefficient, R is the Hydraulic Radius (ft), S is the slope of the energy grade line (ft/ft).
2. At age 0 (New Pipe), the roughness coefficients are commonly used values for new pipes. Roughness coefficients decrease with age at a rate that depends on pipe material. For planning purposes, Roughness of Asbestos Cement and PVC pipes are assumed slightly decreasing, while the remaining pipe materials decrease at higher rates.

5.0 METHODS FOR ESTIMATING WATER REQUIREMENTS

There are two methods to determine water requirements, the Population Method and the Land Use Method. Both methods will be used in this study, each serving a different function during the evaluation process.

The Population Method

The primary purpose of the Population Method is for estimating the City's future water requirements, and for evaluating the adequacy of the supply source. This method utilizes historical annual water consumption and develops water consumption rates based on the corresponding historical population. After evaluating future trends in population that affect water consumption, a rate for future water consumption is developed. This rate can then be applied to the projected future population to estimate the City's future water requirements.

The Land Use Method

The primary purpose of the Land Use Method is for distributing water requirements using a procedure that is sensitive to land use categories to simulate accurate computer modeling of the water system. This method utilizes the City's current land use categories, as defined in the City's General Plan, and develops average annual demand coefficients. These coefficients were determined by distributing the current annual water production to the current acreage of the land use categories. Metering records are essential in the development of the current coefficients. The units of the coefficients are in gallons per minute per acre (gpm/acre), and are directly applied to the acreage throughout the City to determine water requirements. Future water requirements, in any particular area, are determined by applying the developed coefficients to anticipated future growth in that area.

6.0 PER CAPITA CONSUMPTION

The per-capita water consumption rates are based on City-wide population figures, and are calculated by dividing the annual water production by that year's population. This rate is applied to the projected population to estimate the future water requirements.

Historical monthly water production data from 1993 to 1997 were obtained from City staff and summarized in Table 3.2, with monthly production values listed in million gallons (MG). Production fluctuates between months, with the maximum water use months in Porterville occurring in July, as shown in Figure 3.1. Table 3.2 includes an annual water use analysis, listing the maximum month, minimum month, and average month for each year. The average month for a particular year represents the average water consumption during that year, expressed in million gallons.

Based on the City's historical annual population, Table 3.2 also lists the calculated water consumption, per-capita, for each year. The per-capita water consumption rates were calculated by dividing the annual water production by that year's population. Based on the City's population figures, the 1997 City-wide water consumption rate was at 321 gallons per day per capita (gpdpc), while the 5-year average City-wide water consumption rate is 277 gallons per day per capita (gpdpc).

Since the City services extend outside the current City limits, the City's serviced population is higher than the City's published population. The City's 1989 Water Master Plan estimated this population at approximately 15 percent higher than the actual City population, thus reducing the 5-year average City-wide water consumption rate to 241 gpdpc. Table 3.2 also lists a 5-year average City-wide water consumption rate of 252, for a serviced population that is 10 percent higher than the actual population.

This Master Plan will use a City-wide water consumption rate of 250 gpdpc for projecting Porterville's future water requirements. While this rate is lower than rates for unmetered San Joaquin Valley cities, as shown in Table 3.3, it is higher than rates for other metered cities.

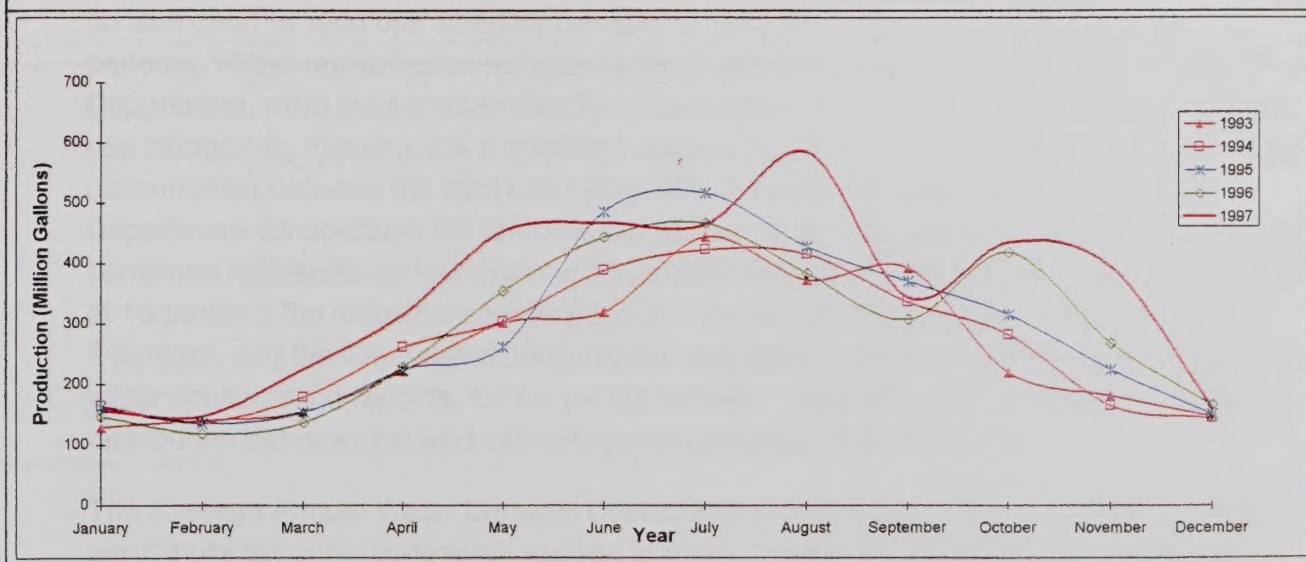
Table 3.2 Monthly Water Production (1993-1997)
City of Porterville Water System Master Plan

Month	1993		1994		1995		1996		1997		5-Year Avg	
	(MG)	(% of total)	(MG)	(% of total)	(MG)	(% of total)	(MG)	(% of total)	(MG)	(% of total)	(MG)	(% of total)
January	130	4%	165	5%	161	5%	147	4%	157	4%	152	4%
February	141	5%	139	4%	135	4%	119	3%	147	4%	136	4%
March	155	5%	180	6%	154	4%	137	4%	225	5%	170	5%
April	222	7%	261	8%	224	7%	230	7%	315	8%	250	7%
May	302	10%	304	9%	261	8%	355	10%	454	11%	335	10%
June	320	11%	389	12%	486	14%	444	13%	467	11%	421	12%
July	444	15%	423	13%	517	15%	467	14%	465	11%	463	14%
August	373	12%	415	13%	428	12%	384	11%	585	14%	437	13%
September	392	13%	336	10%	370	11%	308	9%	344	8%	350	10%
October	220	7%	282	9%	315	9%	419	12%	435	10%	334	10%
November	181	6%	165	5%	224	7%	268	8%	395	10%	247	7%
December	147	5%	144	4%	151	4%	166	5%	161	4%	154	4%
Annual Total	3,027		3,203		3,426		3,444		4,150		3,450	
Water Use Analysis												
Minimum Month	130	4%	139	4%	135	4%	119	3%	147	4%		4%
Average Month	252	8%	267	8%	286	8%	287	8%	346	8%		8%
Maximum Month	444	15%	423	13%	517	15%	467	14%	585	14%		14%
Monthly Peaking Factors												
Min-Month/Avg-Month Ratio	0.52		0.52		0.47		0.41		0.43		0.47	
Max-Month/Avg-Month Ratio	1.76		1.58		1.81		1.63		1.69		1.69	
Per Capita Consumption												
Published Population ¹	32,840		33,803		33,636		34,581		35,428			
Per Capita Consumption, gpcd		253		260		279		273		321		277
Serviced Population												
Scenario 1 ² (Population plus 15 %)	37,766		38,873		38,681		39,768		40,742			
Per Capita Consumption, gpcd		220		225		243		237		279		241
Scenario 2 ³ (Population plus 10 %)	36,124		37,183		37,000		38,039		38,971			
Per Capita Consumption, gpcd		230		236		254		248		292		252

Notes:

1. Federal Census of Housing and Population.
2. In scenario 1, the population serviced by the water system is estimated at 15 % higher than the City population, per the 1989 Water System Master Plan.
3. In scenario 2, the population serviced by the water system is estimated at 10% higher than the City population.

Figure 3.1 Monthly Diurnal Water Production Pattern (1993-1997)
City of Porterville Water System Master Plan



**Table 3.3 Typical City-Wide Water Consumption Rates
City of Porterville Water System Master Plan**

City	Metered	Per Capita Consumption (gpdpc)
Clovis	Yes	205
Coalinga	No	280
Dinuba	Yes	200
Fresno	No	300
Madera	No	280
Modesto	No	250
Porterville	Yes	250
Tulare	No	260
Turlock	No	280
Visalia	No	300

Notes:

1. Per Capital consumption rates change from year to year depending on climate. The rates in this table are based on multiple-year averages.

7.0 AVERAGE ANNUAL DEMAND COEFFICIENTS

In distributing the water demands to the existing hydraulic water model, water requirements are calculated based on actual land uses and their corresponding water demand factors. Since some land uses require larger amounts of water than others, an assessment of water consumption by land use category provides a more accurate representation of water patterns. Water consumption records for the past 5 years, obtained from the City's Finance Department, were evaluated to identify consumption patterns and trends between the land use categories. Figure 3.2 is a graphical representation of the distribution of the 1997 water consumption between the land use categories. It should be noted that the Finance Department consolidates the land use categories for billing purposes. Figure 3.2 shows the combined residential consumption at 75 percent, the consolidated commercial consumption at 10 percent, the industrial consumption at 3 percent, the institutional consumption at 7 percent, and the City-related consumption at 5 percent. An analysis of monthly historical water consumption records, for the period between 1993 and 1997, indicates a pattern of distribution between the land use categories consistent with Figure 3.2.

The Average Annual Water Demand Coefficients are factors, usually expressed in gallons per minute per acre (gpm/acre), applied to gross acreage to generate water demands based on land use categories. These factors were established for Porterville based on a 1997 water balance of 4.15 billion gallons (7,900 gpm) distributed to each land use

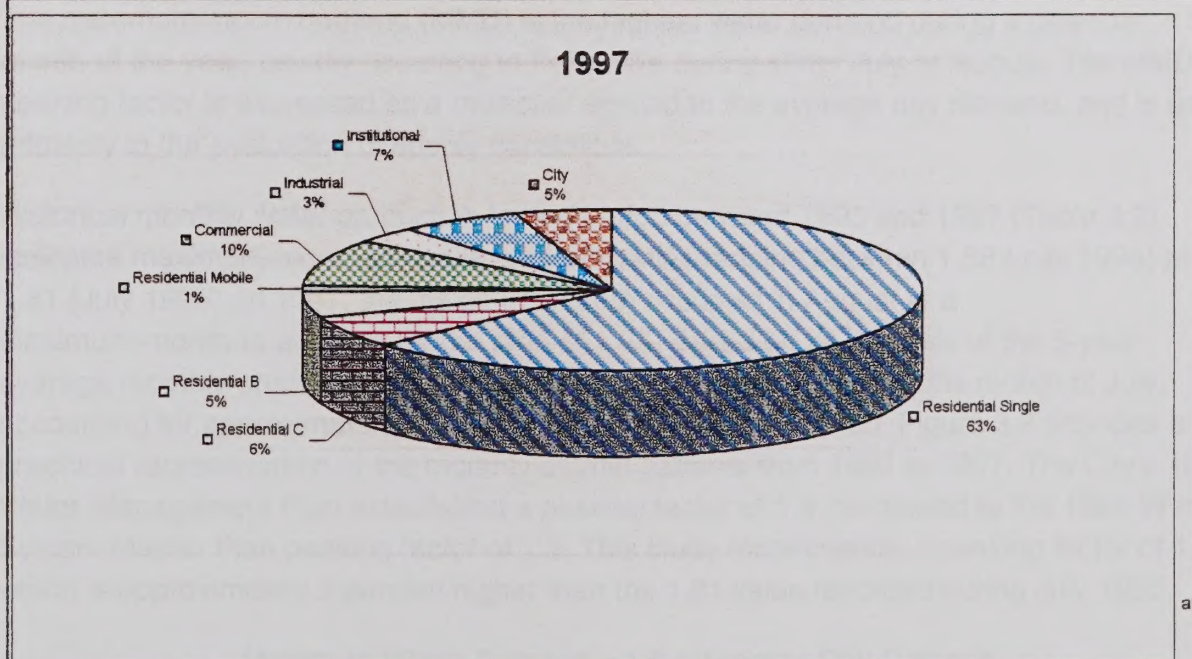
**Table 3.4 Average Annual Water Demand Coefficients
City of Porterville Water System Master Plan**

Land Use Category ¹	Land Use Code	UDB ¹ (acres)	Existing Water Service Area ⁵ (acres) (%)		Average Annual Water Demand Coefficients ⁶		1997 Water Balance ³ (gpm)
					(gpd/acre)	(gpm/acre)	
Hillside Density Residential	HR	Note 7			500	0.35	n/a
Rural Density Residential	RD	540	81	1%	720	0.50	41
Low Density Residential	LD	6,931	3,211	48%	1,584	1.10	3,532
Medium Density Residential	MD	823	657	10%	3,168	2.20	1,445
High Density Residential	HD	433	356	5%	4,608	3.20	1,139
Commercial ⁴	GC, HC, HWYC, PO	1,253	833	12%	1,440	1.00	833
Industrial	IND	868	395	6%	1,440	1.00	395
Public/Quasi Public	PQ	1,097	306	5%	720	0.50	153
Open Space	OS	584	133	2%	288	0.20	27
Agriculture	AG	137	137	2%	0	0.00	0
Airport	PAT	333	333	5%	72	0.05	17
Schools	SCH	351	300	4%	1,728	1.20	360
Totals		13,350	6,742	100%			7,941

Notes:

1. Urban Development Boundary, per Porterville's Land Use Element of the General Plan.
2. Residential density is based on gross acres.
3. The 1997 water production of 4.15 billion gallons (7,900 gpm) was distributed to the land use categories, per metered records.
4. Commercial categories have been consolidated into one category.
5. Existing Served Acreage. The percent was calculated by dividing the land use Served Acreage by the total Served Acreage.
6. Calculated, for each category, by dividing the 1997 Water Balance amount (gpm) by the Existing Served Acreage.
7. In accordance with on-going proposed Land Use modifications, The Hillside Residential Density will include a conversion of approx. 200 acres of Rural Density in the South, 800 acres of Low Density Residential in the east, and 400 acres of Low Density Residential in the north. For a total of 1,400 acres.

**Figure 3.2 Water Consumption, by Land Use Category
City of Porterville Water System Master Plan**



Source: City of Porterville Finance Department.

category in accordance with the distribution observed in historical records (Figure 3.2). Table 3.4 lists, for each land use category, the land use code, the existing service area (in acres), the residential densities, the population densities, and the average annual water demand coefficients.

8.0 WATER USE PEAKING FACTORS

Peaking factors represent the increase above the average annual water demand, experienced during a specified time period. The various peaking conditions are either statistical concepts or numerical values established through a review of historical data and are, at times, adjusted to reflect a level of conservatism.

Peaking conditions that are of particular significance to hydraulic analysis of the water system include the average day demand (ADD), maximum month demand (MMD), maximum day demand (MDD), and the peak hour demand (PHD). Peaking factors for expressing these demands as a function of the average day demand (ADD) were developed based on the City's demand patterns.

Average Day Demand

The Average Day Demand (ADD) for a particular year is equal to the total production for that year, expressed daily units. For example, Table 3.2 indicates that the total production for 1997 was 4.15 billion gallons, translating into an average daily production of 11.4 million gallons per day (7,900 gallons per minute). The ADD is the baseline demand used for calculating other demand conditions including maximum day and peak hour demands.

Maximum Month Demand

The maximum month demand (MMD) is the highest water demand during a calendar month of the year, usually occurring in Porterville during either July or August. The MMD peaking factor is expressed as a multiplier applied to the average day demand, and is used primarily in the evaluation of supply capabilities.

Historical monthly water production for the period between 1993 and 1997 (Table 3.2) indicates maximum-month-to-average-month ratios ranging between 1.58 (July 1994) and 1.81 (July 1995). In 1997, the maximum month occurred in August at a maximum-month-to-average-month ratio of 1.69. Based on an analysis of the 5-year average monthly production (1993-1997), this ratio is highest during the month of July, accounting for approximately 14 percent of the annual production. Figure 3.3 provides a graphical representation of the monthly diurnal patterns from 1993 to 1997. The City's 1985 Water Management Plan established a peaking factor of 1.9, compared to the 1989 Water System Master Plan peaking factor of 1.8. This study recommends a peaking factor of 1.9, which is approximately 5 percent higher than the 1.81 value recorded during July 1995.

$$\text{Maximum Month Demand} = 1.9 \times \text{Average Day Demand}$$

Maximum Day Demand

The maximum day demand (MDD) is the highest water demand during a 24-hour period of the year. The MDD peaking factor is expressed as a multiplier applied to the average day demand. A water system is customarily tested under "maximum day" plus fire flow conditions. Water system sources, such as wells, are typically sized to meet the anticipated maximum day demands of a water system.

Maximum day plus fire flows stress the water system in the specific area of the fire and often show existing deficiencies, if any, in the general area of the fire. To evaluate the effect of maximum day plus fire flow throughout a system, the fire has to be simulated at various critical areas of the system. This condition also demonstrates the performance of supply sources such as water wells, booster pumps, and storage tanks operating under stressful conditions.

In general, the maximum day flow is 2.0 to 2.5 times greater than the average annual demand. No recent City metering records were available to evaluate the maximum day peaking factor. The City's 1985 Water Management Plan established a peaking factor of 2.2, compared to the 1989 Water System Master Plan peaking factor of 2.0. Neither historical nor current daily records were available to perform an analysis of this factor, however, this Master Plan recommends a peaking factor of 2.2, which is approximately 10 percent higher than the 2.0 value suggested in the previous master plan.

$$\text{Maximum Day Demand} = 2.2 \times \text{Average Day Demand}$$

Peak Hour Demand

The peak hour demand (PHD) is the highest water demand during any one-hour period of the year. The PHD is expressed as a multiplier applied to the average annual demand. Peak hour flow simulates high water flows throughout the system during peak demands and identifies areas of the water system that experience low pressures. This condition is similar to applying maximum day plus fire flow, only in this case the entire system is exposed to stressful conditions and there are no additional high point demands.

In general, the peak hour demand is 2.8 to 3.5 times greater than the average annual demand. No recent City metering records were available to evaluate the peak hour peaking factor. The City's 1985 Water Management Plan established a peaking factor of 3.9, compared to the 1989 Water System Master Plan peaking factor of 3.0. Neither historical nor current hourly records were available to perform an analysis of this factor, however, it is likely that Porterville experiences higher hourly peaking factors than 3.0, and a factor of 3.40 is recommended for evaluating Porterville's water system.

$$\text{Peak Hour Demand} = 3.4 \times \text{Average Day Demand}$$

9.0 PLANNING AND DESIGN CRITERIA SUMMARY

Table 3.5 provides a summary of the recommended planning and design criteria for the Porterville water system master plan.

Table 3.5 Planning and Design Criteria Summary
City of Porterville Water System Master Plan

Source of Supply							
The adequate source of supply is required to meet:		Maximum Day Demand + 3,000 gpm (equivalent to three wells).					
Storage							
The adequate City-wide storage shall meet:		Operational Storage = 25% of Maximum Day Demand Fire Storage = 0.63 MG Emergency Storage = underground (provided emergency pumping methods are available for supplying 25% of Maximum Day Demand)					
Distribution Mains							
The distribution system should be sized to meet the greater of:		Peak Hour Demand, or Maximum Day Demand + Fire Flow.					
Criteria for judging the adequacy of existing pipelines:		Maximum desirable pipeline velocity: 8 feet per second Maximum desirable head loss: 10 feet/1,000 feet					
Headloss in Existing Pipes							
Headloss in the Hazen Williams equation for pipes shall be calculated based on the following table:							
Pipe Material	0	5	10	20	30	40	50
Asbestos Cement	140	138	136	132	128	124	120
Cast Iron	130	120	111	96	87	80	60
Ductile Iron	130	120	111	96	87	80	60
Plastic (PVC)	150	149	148	146	144	142	140
Steel	125	115	106	91	82	75	65
Service Pressures							
The recommended high/low pressures are as follows:		Maximum Pressure =					65 psi
		Minimum Pressure (during Maximum Day) =					40 psi
		Minimum Pressure (during Peak Hour) =					35 psi
		Minimum Residual Pressure (during fires) =					20 psi
Water Use Peaking Factors							
Fluctuations in water demands shall be based on:		Maximum Month Demand =		1.9 x Average Day Demand			
		Maximum Day Demand =		2.2 x Average Day Demand			
		Peak Hour Demand =		3.4 x Average Day Demand			
Per Capita Water Consumption							
Demand forecasting shall be based on:		City-Wide = 250 gpcd					
Average Annual Demand Coefficients							
These demand coefficients are applied to the gross land use acreages to yield average day water demands							
Land Use Category	Code	Coefficients					
		(gpd/acre)	(gpm/acre)				
Hillside Density Residential	HR	500	0.35				
Rural Density Residential	RD	720	0.50				
Low Density Residential	LD	1,584	1.10				
Medium Density Residential	MD	3,168	2.20				
High Density Residential	HD	4,608	3.20				
Commercial	NC, GC, HWYC, HC, PO	1,440	1.00				
Industrial	IND	1,440	1.00				
Public and Quasi Public	PQ	720	0.50				
Open Space	OS	288	0.20				
Agriculture	AG	0	0.00				
Porterville Air Terminal	PAT	72	0.05				
Schools	SCH	1,728	1.20				
Fire Flows							
Per the City of Porterville Fire	Residential fire flow =	1,000 gpm					
Department, water system response to	Residential fire flow =	1,500 gpm (Floor Area greater than 3,600 sq. ft.)					
the following fire flows is considered	Commercial fire flow =	2,500 gpm					
adequate:	Industrial fire flow =	3,500 gpm					

Scenic Heights Specific Area Preliminary Water Storage Requirements

1. Water Demand Criteria

Maximum Day Demand = 2.2 x Average Day Demand
Peak Hour Demand = 3.4 x Average Day Demand

2. Water Supply Criteria

2.1 City Wide

Source of Supply to Provide Maximum Day + 3,000 gpm
Peak Hour provided by Storage

2.2 Scenic Heights Specific Area

No Source of Supply Available in Area
Supply to Rely on Scenic Heights 3 MG tank

3. Water Storage Criteria

3.1 City Wide

Operational Storage	25 % of Maximum Day Demand
Fire Storage	3,500 gpm for 3 hours
Emergency Storage	Underground. (However, NEED Emergency Power Generators)

3.2 Scenic Heights Specific Area

Operational Storage	From Other Zone (3 MG Scenic Heights). Also, see (note b)
Fire Storage	1,000 gpm for 2 hours
Emergency Storage	50% of Maximum Day Demand

4. Water Demand - Scenic Heights Specific Area

	<u>Code</u>	<u>acres</u>		
Existing Service Area (approximate)	A	50		
Ultimate Service Area (approximate)	B	60		
	<u>Code</u>	<u>gpd/acre</u>	<u>gpm/acre</u>	
Land Use Coefficient (preliminary)				
Low Density Residential	C	1,200	0.83	
Average Day Demand (B x C)	D	72,000	50	
Maximum Day Demand (D * 2.2)	E	158,400	110	
Peak Hour Demand (D * 3.4)	F	244,800	170	

Scenic Heights Specific Area Preliminary Water Storage Requirements (Cont'd)

5. Water Supply - Scenic Heights Specific Area

Supply from 3 MG Scenic Heights Storage Tank
No Other Source of Supply Available.
Therefore, Emergency Storage is Needed.

6. Water Storage - Scenic Heights Specific Area

	<u>gallons</u>	
Operational Storage		(Note b)
Fire Storage (1,000 gpm * 2 hours)	120,000	
Emergency Storage (0.5 * E)	79,200	
Total Storage Needed	199,200	

7. New Storage Tank Size - Scenic Heights Specific Area

Minimum Storage Tank Size	200,000	(Note a)
Recommended Storage Tank Size	300,000	(Note b)

Notes:

- a) Accounts for 2-hour residential fire plus emergency storage at 50% maximum day
- b) During water system operation, it is likely that the New tank may inadvertently be used for operation purposes. To account for that possibility, It is recommended that the tank be upsized by one-third (1/3). This additional 1/3 capacity, reserved for operation purposes, can also be used for energy management.

Chapter 4

EXISTING WATER SYSTEM AND HYDRAULIC MODEL

This chapter describes the existing water system and the hydraulic water model assembled for evaluating the distribution system. Discussion of the major water supply and distribution system components are provided. This chapter also presents the results of the calibration effort which was performed to establish a level of confidence in the City's hydraulic model.

1.0 EXISTING WATER SYSTEM

The City's municipal water system extracts water from underground aquifers via a series of groundwater wells distributed throughout the westerly half of the City. The City's water facilities include a distribution system with pipe sizes ranging between 2 and 16 inches in diameter, booster pump stations, storage tanks, and pressure reducing valves between pressure zones.

Supply Capacity

The City of Porterville currently extracts its water supply from groundwater aquifers via twenty-three (23) active wells, ten (10) available non-active wells, and four (4) standby wells. Most of the City's wells are gravel packed and range from 230 feet to 700 feet in depth.

Information on the groundwater condition was extracted from existing reports and studies, including the City's 1990 Urban Water Management Plan, as this project did not include groundwater analysis. The Porterville area is underlain by an unconfined aquifer, which is a part of the Tule Sub-Basin of the San Joaquin Valley Watershed. The source for the recharge of the Tule Sub-Basin is the Tule River, which crosses the planning area and has an annual runoff of 136,000 acre-feet. During drought years the Sub-Basin has been experiencing an overdraft of approximately 163,000 acre-feet per year since 1975. According to City staff, recent water quality produced from active wells meet the current State and Federal drinking water regulations.

Table 4.1 lists the current capacities of the City's water supply wells, as rated by City staff in June 1998. The total supply capacity, following the City's repair of Well No. 18 and the addition of Well No. 25, is approximately 13,845 gpm.

Table 4.1 Current Groundwater Supply Capacity
City of Porterville Water System Master Plan

Well No.	Status (Jan. 1997)	SCE Rated Capacity ¹ (gpm)	Current Capacity Rating ² (gpm)
C-1		998	505
C-2	Inactive	909	n/a
C-3		724	388
C-4		505	403
C-5	Abandoned	908	n/a
C-6	Inactive	725	n/a
C-7		618	418
C-10		421	448
C-11		467	254
C-12	Inactive	638	n/a
C-13	Inactive	416	n/a
C-15		608	454
C-16		684	623
C-17		419	1,305
C-18	Recent Repair	505	975
C-19		827	463
C-20		1,426	1,151
C-21	Seasonal	897	n/a
C-22	Seasonal	1,988	1,750
C-23		685	553
C-24		1,241	1,211
C-25	New	n/a	1,000
AP-1		469	n/a
AP-2		n/a	n/a
L-1		54	239
L-2		125	433
L-3		117	n/a
L-4		113	n/a
L-5		74	493
L-6		n/a	n/a
L-7		n/a	415
R-7		n/a	364
R-11		<u>n/a</u>	<u>n/a</u>
Total			13,845

Notes:

1. SCE rated capacities. Test dates vary.
2. More realistic capacities, rated by City staff in June 1998.
Well No. 18 was recently repaired and Well No. 25 is new.

Storage Capacity

The City is currently operating four ground level storage tanks with a total capacity of 6.35 MG (Table 4.2). Two of the tanks, the East Porterville Tank and the Scenic Heights Tank, have an individual capacity of 3 million gallons (MG) each, the Upper Scenic Heights Tank has a capacity of 50,000 gallons, and the Airport Tank has a capacity of 0.3 MG.

Figure 4.1 is a schematic diagram of the existing hydraulic profile that illustrates the elevations relevant to each storage tank, including the bottom, top, and operational elevations. The figure also indicates the relationship between the tanks and the City's pressure zones, and the presence of PRVs, groundwater wells, and booster stations. The smaller pressure zones are not shown on this diagram as they would reduce the clarity of this profile. Note that the Airport Pressure Zone is (shown) separated from the rest of the system as it is not currently connected to the City's main distribution system.

Table 4.2 Current Storage Capacity
City of Porterville Water System Master Plan

Storage Tank	Capacity (MG)	Servicing Pressure Zone	Elevations		
			Bottom (ft)	Top (ft)	HGL (ft)
Upper Scenic Heights	0.05	Scenic Heights	661	681	680
Scenic Heights	3.00	Central/Scenic Heights	572	607	597
East Porterville	3.00	East/Central	612	647	637
Airport	<u>0.30</u>	Airport	n/a	n/a	n/a
Total	6.35				
Notes:					
1. The airport tank is only connected to the airport water system.					

Pressure Zones

The City's distribution system is divided into three major pressure zones (East, Central, and West), and smaller pressure zones including Airport, Scenic Heights, Jasmine Ranch, and Corona Heights.

East Pressure Zone

The East Pressure Zone is generally located east of Plano Street and relies on the 3 MG East Porterville Tank for servicing elevations that range between 520 feet and 470 feet. A booster pump station at Plano Street and Henderson Avenue draws water from the Central Pressure Zone to fill the 3 MG East Porterville Tank.

Central Pressure Zone

The Central Pressure Zone constitutes the majority of the distribution system and is generally bound by Plano Street to the east and Newcomb Street to the west. The Central Pressure Zone relies on the 3 MG Scenic Heights Tank, in addition to a series of supply wells within the boundaries of this zone, for servicing elevations that range between 470 feet and 425 feet. The Scenic Heights Booster Pump Station and the groundwater wells within the Central Pressure Zone fill the 3 MG Scenic Heights Tank

A series of pressure reducing valves (PRVs) isolate the East Pressure Zone from the Central Pressure Zone. The locations of the PRVs, their sizes, and their current pressure settings are listed in Table 4.3. For easier identification, PRVs along the Plano Avenue alignment have been assigned an alphanumeric code that begins with the letters "EC" which indicates that the PRV is located along the boundary between the East and Central Pressure Zones.

West Pressure Zone

The West Pressure Zone is bound by the Central Pressure Zone to the east and the Friant-Kern Canal to the west. The PRVs that isolate the Central Pressure Zone from the West Pressure Zone have been assigned an alphanumeric code that begins with the letters "CW". This zone relies on series of wells within the zone boundaries, as well as water from the Central Pressure Zone, for servicing elevations below 425 feet.

Airport Pressure Zone

The Airport Pressure Zone is a separate pressure zone as it is not connected to the City's main water distribution system. It is supplied water by two groundwater wells. A 300,000 gallon ground-level storage tank with a booster station services elevations ranging between 445 feet and 420 feet. Since the storage tank is at ground level, it is assisted by two booster pumps to provide appropriate pressures to the system.

Scenic Heights Pressure Zone

The Scenic Heights Pressure Zone is located on the northeasterly boundary of the Central Pressure Zone and services an area of Porterville known as Scenic Heights. Two small booster pumps draw water from the 3 MG Scenic Heights Tank to fill the 50,000 gallon Upper Scenic Heights Tank, located at a higher elevation north of the Scenic Heights Tank.

Other Pressure Zones

There are other isolated and relatively small pressure zones within the Porterville water system. These zones are briefly discussed below:

- Booster pumps and a hydro pneumatic tank at the 3 MG East Porterville Tank serve the residential subdivision known as Jasmine Ranch.

Table 4.3 Pressure Reducing Valves
City of Porterville Water System Master Plan

PRV	Location	Size (inches)	Upstream Pressure (psi)	Downstream Pressure (psi)
<u>East-Central Pressure Zones</u>				
EC-1	East Porterville Booster Pump Station.	12-inch combination PRV and solenoid shut off valve	not operational	not operational
EC-2	East Porterville Booster Pump Station	6-inch combination PRV and solenoid shut off valve	not operational	not operational
EC-3	Grand Avenue at Sierra Vista Street	8	70	53
EC-4	Putnam Avenue at Murry Park	8	63	50
EC-5	Leggett Street at Orange Avenue	12	70	50
EC-6	Orange Avenue at Leggett Street	6	70	52
EC-7	Mulberry Avenue, west of Plano Street	8	58	53
EC-8	Henderson Avenue at Plano Street	8	80	60
<u>Central-West Pressure Zones</u>				
CW-1	Olive Avenue at Newcomb Street	6	72	45
CW-2	Putnam Avenue at Newcomb Street	4	79	51
CW-3	Thurman Avenue at Newcomb Street	6	80	54
CW-4	Mathew Avenue at White Chapel Avenue	4	75	50
CW-5	Henderson Avenue at Balmoral Drive	10	78	54
CW-6	Westfield Avenue at Newcomb Street	10	78	65
CW-7	Median Avenue at Newcomb Street	6	74	60
CW-8	Castle Avenue at Newcomb Street	6	73	60

Notes:

- EC-7 and EC-8 constitute a separate, small pressure zone.
EC-8 extracts water from the East Pressure Zone and establishes the Hydraulic Grade Line for the small zone.
- CW-7 and CW-8 constitute a separate, small pressure zone.
CW-7 and CW-8 both establish the Hydraulic Grade Line in that zone.

- A booster pump extracts water from the Central Pressure Zone and services Corona Heights.
- The new high school at Holcomb Street and Olive Avenue is in a pressure zone defined by a new Granite Hill Booster Station that extracts water from the East Pressure Zone.
- A small pressure zone is defined by PRVs EC-7 and EC-8. EC-8 receives and controls water from the East Pressure Zone, while EC-7 bleeds into the Central Pressure Zone.
- A small pressure zone is defined by PRVs CW-7 and CW-8. Both PRVs control the pressures into this zone, which extracts water from the Central Pressure Zone.

System Operation Controls

A Supervisory Control and Data Acquisition (SCADA) system monitors and controls the operation of the water system. Four pressure transducers spread throughout the Central Pressure Zone transmit readings to the City's Central Computer which averages the four readings and compares the value with a pre-established high and low pressure set points. Accordingly, the SCADA system will activate or deactivate wells to maintain the system pressures within the set pressure points.

Not all the water system components are connected to the SCADA system. In the West Pressure Zone, only Well No. 24 is connected to the SCADA system, while the remaining wells are equipped with local pressure switches with on/off set points.

Currently the Scenic Heights Booster Pump Station, which fills the 3 MG Scenic Heights Tank, operates independently of the SCADA system. If the water level in the 3 MG Scenic Heights Tank reaches a high-level set point, an override program will start deactivating wells. According to City staff, a SCADA system upgrade will link the Central Computer with a Remote Terminal Unit (RTU) at the Scenic Heights Booster pump station.

The SCADA system also monitors the smaller (50,000 gallons) Scenic Heights Tank level, and controls the related smaller booster pumps to activate or deactivate based on the tank level.

If the water level in the East Porterville Tank reaches a low-level set point during a set time of day, then the booster pump station at Plano Street and Henderson Avenue will activate. The Booster Pump Station will deactivate if the water level in the East Porterville Tank reaches a high-level set point. A low-level setting will turn the booster pump station on, overriding the time of day operating parameters.

The SCADA system monitors the 300,000 gallon tank level and the system pressure at the municipal airport. An alarm alerts staff of both high and low tank levels, or high and low system pressures. The variable frequency drive (VFD) pump at the groundwater well (Airport Well No. 2) operates under the local RTU control and is monitored by the Central Computer.

Distribution System

Porterville water distribution system consist of supply lines that are laid out in a gridlike manner minimizing dead ends of major mains, except at the system extremities. This design, also known as "looping", mitigates the possibility of water stagnating at dead ends. Also, when repairs are required, water can be redirected around the repair through another part of the loop. Additionally, head loss (pressure loss) is minimized in a gridlike system during peak hour demands.

Water distribution mains carry water from the supply point (i.e. the wells and reservoirs in Porterville case) to the demand point (i.e. the consumer's service connection). Porterville's distribution system was designed and constructed as the town expanded. As development occurred along the edges of town, pipelines were extended, new wells were drilled, and new transmission mains were connected to the existing distribution system.

The existing distribution pipes range in size from 2 to 16 inches in diameter. The older water mains are primarily asbestos-cement, cast iron, and steel. Recent pipe installations have been predominantly AWWA C900 polyvinyl chloride (PVC) pipes and ductile iron.

2.0 HYDRAULIC MODEL

Hydraulic network analysis is a powerful tool used in all aspects of water distribution planning, design, operation, management, emergency response, system reliability analysis, fire flow capacity evaluation, and most recently water quality simulation. Porterville's hydraulic model was used to evaluate the adequacy of the City's existing water system and in planning the City's future facilities.

Hydraulic Model Selection

There is an abundance of network analysis software in the marketplace today with a variety of features and capabilities. The selection of a particular model generally depends on user preferences and the operational requirements of the water system.

At the beginning of this project, a workshop was held with City staff to discuss the criteria, features, and costs desired in a hydraulic model. The criteria that were considered include: hydraulic analysis capabilities, water quality tracing capabilities, availability of support, graphics output types, model capacities, simulation characteristics, ease of use, input formats, and finally cost. It was agreed that H2ONET version 2 would be used by Carollo Engineers to assemble the hydraulic model.

H2ONET runs inside AutoCAD release 14 and uses the increasingly popular EPANET hydraulic engine for processing the hydraulic calculations. It should be noted that the assembled hydraulic model can be easily exported to a format compatible with the standalone version of EPANET. The hydraulic model files can also be exported to ARCVIEW or ARCINFO.

Elements of the Hydraulic Model

The City's hydraulic model combines information on the physical and operational characteristics of the water system, and performs calculations to solve a series of mathematical equations to simulate flows in pipes and pressures at nodes. Elements comprising the computer modeling process are: skeletonizing the water system, defining pipes and nodes, and identifying the service areas.

Skeletonizing

Skeletonizing is the process by which water networks are stripped of pipelines not considered essential for the intended analysis purpose. The purpose of skeletonizing a system is to develop a model that accurately simulates the hydraulics of the pipelines delivering water through the system. At the same time, skeletonizing should reduce the complexity of the large model, minimizing the time of analysis, and comply with the limitations imposed by the computer program.

In Porterville's case, an effort was made to digitize a majority of the existing distribution pipes, including pipe sizes that are 8 inches in diameter in addition to a large number of critical 6-inch diameter pipes. Figure 4.2 is a graphical representation of Porterville's water distribution system, plotted using EPANET.

Pipes and Nodes

Computer modeling requires gathering detailed numerical information on the physical characteristic of the modeled water system, such as pipe sizes (diameters), lengths, and general system geometry.

Pipes and nodes represent the physical elements describing the water network. A node represents a location in the network where a demand can be applied or water supplied to the system, while a pipe segment represents the actual transmission or distribution pipe itself. Pump performance curve data, defining the operation of the existing pumps and booster stations, were also incorporated in the computer model.

Water Tributary Areas

Allocating water demands to appropriate locations throughout the system was accomplished by defining water demand areas tributary to individual nodes, identifying the areas (acres) of water user groups within each service area, then applying the appropriate average day demand coefficients to each water user group in those areas. Water demand distribution was performed based on the land use categories generating flows in accordance with the developed average day demand conditions. These coefficients were defined and discussed in a previous chapter.

Hydraulic Model Calibration

Porterville's hydraulic model was calibrated to establish a level of confidence in the pressures and flows that it simulates. The calibrated model serves as an established benchmark for further analysis and evaluation. Pressure and flow values from future analysis can be compared to the benchmark model. Future analysis consists of

modifications to the calibrated model to simulate other water consumption patterns, operating scenarios, or additional facilities.

Calibration is complicated by the fact that some data are known and unchanging, some are variable over time, while others are estimated. Pipe information such as diameter, lengths, and location are known. Operations data obtained from SCADA systems vary with time of day, season, and total number of customers. For instance, pump rates and discharge pressures vary over time to respond to variations in consumption. Calibration can be performed for either steady-state or extended period simulation. Calibration with steady-state simulation is usually performed during the peak hour demand condition.

Calibration with the extended-period simulation is more difficult than the steady-state calibration and will have a lesser degree of accuracy. Porterville's model was calibrated for the steady-state simulation during the high demand conditions of June 29, 1998 at 6:47 p.m.

Though the calibration effort can be influenced by the number of pipes that are modeled, it is more directly influenced by the number of pumps, tanks, and pressure regulating valves. In excess of one hundred (100) modeling runs were performed during the calibration process of Porterville's water hydraulic model. Field fire flow tests, conducted by the City's Fire department, provided supplemental information to confirm the calibration results shown on Table 4.4.

Table 4.4 provides a comparison in pressure and in percentage between the model simulated results and the SCADA monitored measurements for June 29, 1998. The comparison shows that the calibration effort yielded highly reasonable values, matching many calibration points (0 percent difference) and maintaining an accuracy of 8 percent or better.

Figure 4.2 - Existing Water Distribution System Schematic

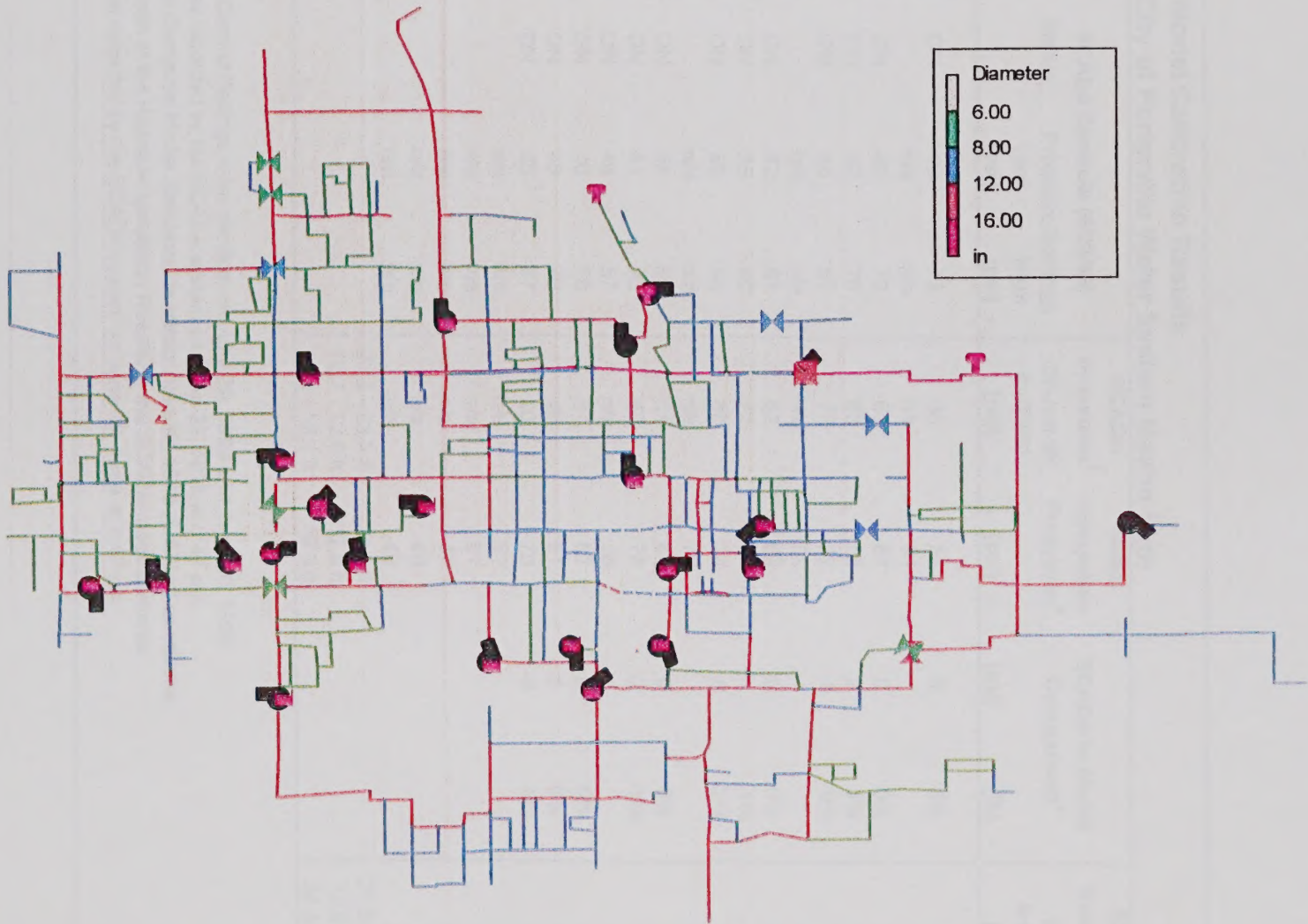


Table 4.4 Model Calibration Results
City of Porterville Water System Master Plan

Well No.	SCADA Controls (6/29/98) ¹			SCADA Pressures ²	Model Simulation Pressures ³	SCADA to Model Comparison ⁴		SCADA Pressures ⁵
	Status	Pressure Settings		29-Jun-98 6:47 PM	(psi)	Comparison ⁴		30-Jun-98 8:47 AM
		Low (psi)	High (psi)	(psi)		(psi)	(%)	(psi)
C-1	ON	40	73	58	58	0	0%	57
C-3		n/a	n/a	n/a	61			n/a
C-4	ON	40	73	61	61	0	0%	59
C-7	ON	42	79	63	65	2	3%	63
C-10	ON	45	80	77	72	-5	-6%	75
C-11		n/a	n/a	n/a	59			n/a
C-15	ON	42	87	62	62	0	0%	60
C-16	ON	35	80	72	71	-1	-1%	69
C-17	ON	50	98	80	74	-6	-8%	80
C-18		n/a	n/a	n/a	70			n/a
C-19	ON	45	95	64	64	0	0%	63
C-20	ON	41	95	80	78	-2	-3%	77
C-22	ON	45	87	n/a	76			n/a
C-23	ON	40	78	67	67	0	0%	66
C-24	ON	46	70	48	51	3	6%	57
C-25	ON	45	87	80	76	-4	-5%	80
L-1		n/a	n/a	n/a	51			n/a
L-2		n/a	n/a	n/a	51			n/a
L-5		n/a	n/a	n/a	47			n/a
L-7		n/a	n/a	n/a	49			n/a
R-7		n/a	n/a	n/a	49			n/a
SC_HT_3MG				23.3 - 23.3 ft	23.3 ft			23.8 - 23.8 ft
SC_HT_50K				12.7 - 12.8 ft	12.8 ft			13.8 - 14.3 ft
E_PV_3MG				19.3 - 19.1 ft	19.3 ft			24.5 - 24.7 ft

Notes:

1. SCADA Control Settings were identical on June 29, 1998 and June 30, 1998
2. Pressures recorded by the SCADA system on June 29, 1998 at 6:47 pm.
3. Hydraulic Computer Model Simulation to mimic June 29, 1998 (6:47pm) conditions.
4. Comparison of the Hydraulic simulation Results to the SCADA measurements.
5. Pressures recorded by the SCADA system on June 30, 1998 at 8:47 pm.

Chapter 5

WATER SYSTEM EVALUATION AND PROPOSED FACILITIES IMPROVEMENTS

This chapter identifies existing water use and develops future water supply and storage requirements based on the population projections, potential growth, and land use, as presented in a previous chapter. This chapter also presents improvements to mitigate existing system deficiencies and for expansion of the future water system. These improvements are recommended based on the system's technical requirements, cost effectiveness, and operational reliability.

1.0 WATER SUPPLY REQUIREMENTS

Porterville currently relies on groundwater to meet its supply needs, and the City's current groundwater management plan does not discourage reliance on the groundwater aquifers as an expanding source for future water supply. Furthermore, City records do not indicate any significant over drafting of the groundwater aquifers at this time. Thus for the purpose of this water master plan, groundwater will be assumed to provide sufficient capacity to meet future water requirements. Should an updated groundwater study indicate otherwise, then the use of surface water as a supplemental source of supply becomes an attractive alternative, which will necessitate an update to the improvements presented in this master plan.

Future water supply requirements were estimated utilizing the Population Method. In this method, the future annual population growth, projected at 3.5 percent per year, is applied to determine population estimates through the planning horizon of 2015. Additionally, the future per-capita water consumption rate, estimated at 250 gpdpc, is applied to the population estimates to determine the average annual water requirements. Future maximum day water requirements are estimated by multiplying the average annual water demands by a factor of 2.2, in accordance with the planning criteria established in a previous chapter.

Table 5.1 lists future water supply requirements for average day demands, maximum day demand, and maximum day demands plus standby supply (3,000 gpm). The City's current water production capacity (i.e. groundwater wells), as estimated in a previous chapter, is 13,858 gpm. This capacity can almost meet the maximum day demand of 14,005 gpm, provided all wells are in service and operating. However, the previously established criteria for the supply capacity dictates providing for an additional 3,000 gpm standby capacity, for a total source of supply requirement for 1998 of 17,005 gpm.

Locating sites for the future wells should consider factors that include land availability and timing of development and related distribution main construction. Most importantly, location should be based on expected yields and groundwater water quality at the considered site. Due to the absence of a more specific groundwater study at present, this master plan quantifies the current and future water supply needs, and recommends groundwater wells

for meeting the needs. Wells needed for correcting existing deficiencies will be tentatively sited within an area that has historically provided acceptable yields. According to City staff, the area is generally bounded by Grand Avenue on the north, Main Street on the east, and Mathew Street on the west.

Existing Supply Deficiency

The resulting current deficiency in the water production capacity, estimated at over 5,000 gpm, can be mitigated with the construction of five new wells with a 1,000 gpm capacity each. Due to timing of this master plan and to fiscal and budgetary issues, it is deemed highly unlikely that five new wells can be constructed by the end of this year. Rather, it was assumed that they might be constructed by the end of 2002.

Future Supply Needs

Meeting projected future water requirements will necessitate the addition of two (2) more wells between the period 2001-2005, four (4) wells between the period 2006-2010, and four (4) wells between the period 2011-2015.

For master planning purposes, it was determined that each new well's production capacities will average approximately 1,000 gpm. As the actual well production may vary, the number of future wells may need to be adjusted.

2.0 WATER STORAGE REQUIREMENTS

The existing four storage tanks operated by the City provide the distribution system with a storage capacity of 6.35 MG. The storage criteria, established in a previous chapter, dictates that the capacity accounts for operational storage, emergency storage, and fire fighting storage.

Martin Hill Tank

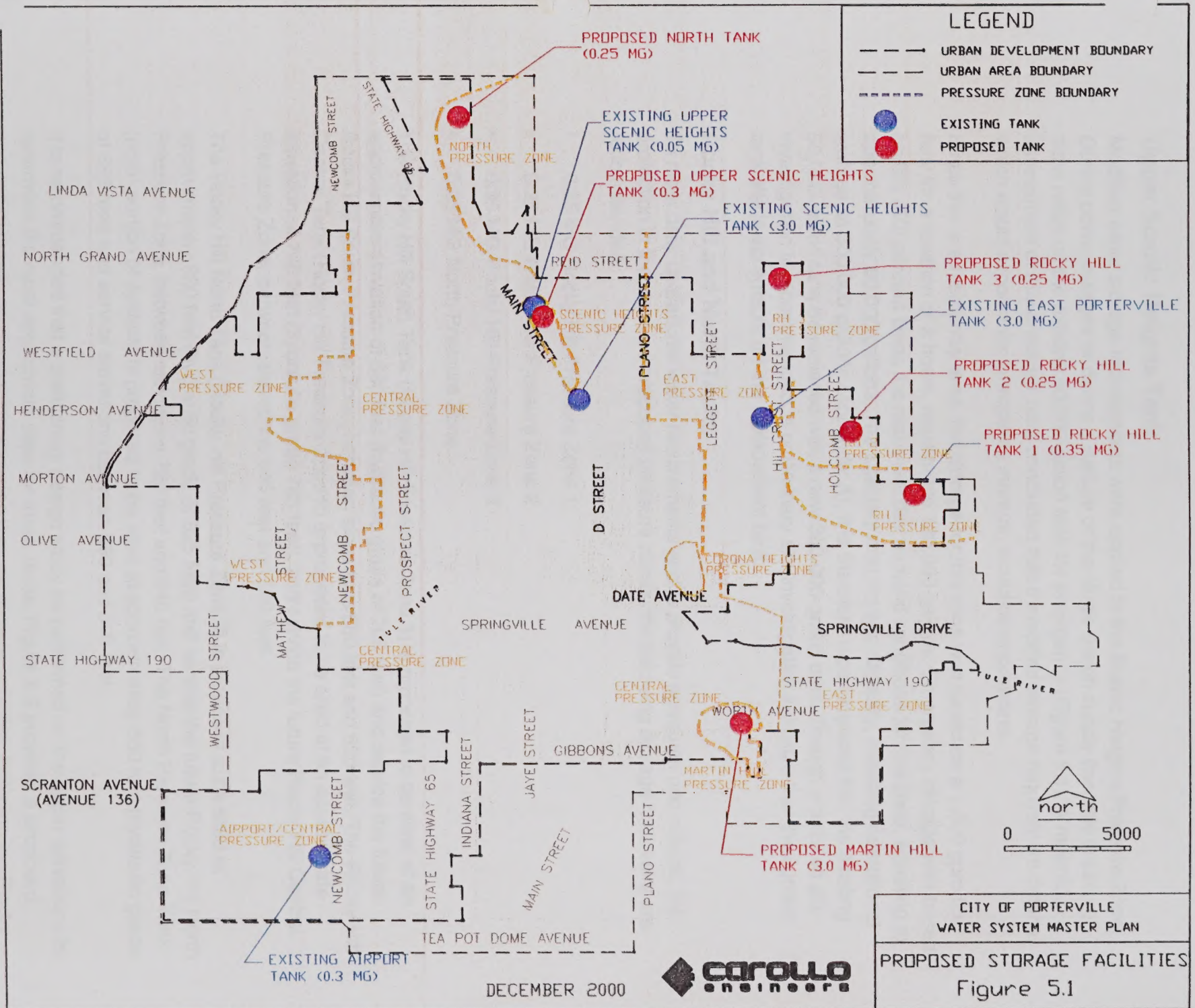
Table 5.1, which identifies the current (1998) and future water storage requirements, indicates that the City's current storage capacity of 6.35 MG is above the 1998 water storage requirement of 5.67 MG. Table 5.1 also indicates that additional storage capacity will be required to meet the City's future water storage requirements beyond the year 2002. A variety of sizing and construction timing alternatives could be considered to meet future storage requirements. City engineering staff, in anticipating the need for future storage requirements, have completed the acquisition of an elevated site on Martin Hill in the south portion of the City (Figure 5.1). The location of the new site takes full advantage of the elevated ground geography and efficiently enhances the hydraulic conditions of the water system. Additionally, the City has completed the design for a 3 MG tank on that site. The new tank, which will connect to the Central Pressure Zone via a proposed 16-inch pipe, is anticipated to have a bottom elevation of 567 feet, and a top elevation of 601 feet.

Table 5.1 Water Supply and Storage Requirements
City of Porterville Water System Master Plan

Year	Projected Population ¹ (at 3.5%)	Water Supply Requirements							Water Storage Requirements					
		Water Demands			Future Groundwater Wells				Future Storage Tanks					
		Average Day ² (gpm)	Maximum Day ³ (gpm)	Max-Day+ Standby ⁴ (gpm)	Available Well Cap. ⁵ (gpm)	Additional Wells ⁶ (1,000 gpm)	Additional Well Nos. ⁷	Total Well Capacity ⁸ (gpm)	Available Storage ⁹ (MG)	Oper/Emerg Storage ¹⁰ (MG)	Fire Storage ¹¹ (MG)	Required Storage ¹² (MG)	Additional Storage ¹³ (MG)	Total Storage ¹⁴ (MG)
1998	36,668	6,366	14,005	17,005	13,845			13,845	6.35	5.04	0.63	5.67		6.35
1999	37,951	6,589	14,495	17,495	13,845			13,845	6.35	5.22	0.63	5.85		6.35
2000	39,280	6,819	15,003	18,003	13,845	2	26-27	15,845	6.35	5.40	0.63	6.03		6.35
2001	40,654	7,058	15,528	18,528	15,845	2	28-29	17,845	6.35	5.59	0.63	6.22	0.30	6.65
2002	42,077	7,305	16,071	19,071	17,845	1	30	18,845	6.65	5.79	0.63	6.42	3.00	9.65
2003	43,550	7,561	16,634	19,634	18,845	1	31	19,845	9.65	5.99	0.63	6.62		9.65
2004	45,074	7,825	17,216	20,216	19,845	1	32	20,845	9.65	6.20	0.63	6.83		9.65
2005	46,652	8,099	17,818	20,818	20,845			20,845	9.65	6.41	0.63	7.04	0.35	10.00
2006	48,285	8,383	18,442	21,442	20,845	1	33	21,845	10.00	6.64	0.63	7.27		10.00
2007	49,975	8,676	19,088	22,088	21,845	1	34	22,845	10.00	6.87	0.63	7.50		10.00
2008	51,724	8,980	19,756	22,756	22,845			22,845	10.00	7.11	0.63	7.74		10.00
2009	53,534	9,294	20,447	23,447	22,845	1	35	23,845	10.00	7.36	0.63	7.99	0.25	10.25
2010	55,408	9,619	21,163	24,163	23,845	1	36	24,845	10.25	7.62	0.63	8.25		10.25
2011	57,347	9,956	21,903	24,903	24,845	1	37	25,845	10.25	7.89	0.63	8.52		10.25
2012	59,354	10,305	22,670	25,670	25,845			25,845	10.25	8.16	0.63	8.79	0.25	10.50
2013	61,432	10,665	23,463	26,463	25,845	1	38	26,845	10.50	8.45	0.63	9.08		10.50
2014	63,582	11,039	24,285	27,285	26,845	1	39	27,845	10.50	8.74	0.63	9.37	0.25	10.75
2015	65,807	11,425	25,135	28,135	27,845	1	40	28,845	10.75	9.05	0.63	9.68		10.75

Notes:

- Porterville's historical population annual growth rate, for the past 10 years, was 3.48% . Projected Population is based on an annual growth rate of 3.5%.
- The Average Day Demand is the Annual Production divided by 365 days. Future ADD values were calculated by multiplying Projected Population by 250 gpcd.
- The Maximum Day Demand, the highest production day usually during hot summer months, is calculated at 2.2 times the Average Day Demand.
- Porterville Criteria dictates that the Supply Source meets the Maximum Day Demand, plus a provision for standby wells equivalent to 3,000 gpm.
- 1998 Groundwater Well Capacity was estimated by City staff. Initial Well Capacity, for a particular year, is equal to the Total Well Capacity of the previous year.
Comparison of this capacity to the required capacity (Maximum Day Demand plus Standby) determines if new wells are needed.
- Proposed New Wells. New Well Production Capacity was estimated at 1,000 gpm. As the actual Well production may vary, the number of future Wells may need to be adjusted.
- Proposed Well Designation Numbers, starting with number 26.
- Total Well Capacity , for a particular year, is calculated by adding the Initial Well Capacity to the New Capacity resulting from adding new wells, when applicable.
- Storage Facilities for 1998 consist of : 3MG Scenic Heights + 3 MG E. Porterv. + 50K Scenic Heights + 300K Airport = 6.35 MG
Available Storage, for a particular year, is equal to the Total Storage of the previous year.
- Operational Storage is calculated at 25% of the Maximum Day Demand. Emergency Storage is considered underground, provided reliable pumping is available.
- Fire Storage is calculated at 0.63 MG, based on an anticipated 3,500 gpm fire for a duration of 3 hours
- Required Storage, for a particular year, is equal to Operational, Emergency, and Fire Storage.
Comparison of this Storage to the Initial Available Storage determines if new storage is needed.
- Proposed Additional Storage was sized to meet future water requirements and provide self-sufficient fire flows for new pressure zones.
Storage Analysis, and pressure zone needs require the following tanks, listed in order of current priority:
 Mitigating Existing Deficiencies: 3.0 MG Martin Hill Tank in the Central Pressure Zone
 Mitigating Existing Deficiencies: 0.3 MG Upper Scenic Heights Tank in the Scenic Heights Pressure Zone
 System Expansion (2000-2005): 0.35 Rocky Hill 1 Tank in the future Rocky Hill 1 Pressure Zone
 System Expansion (2005-2010): 0.25 Rocky Hill 2 Tank in the future Rocky Hill 2 Pressure Zone
 System Expansion (2010-2015): 0.25 Rocky Hill 3 Tank in the future Rocky Hill 3 Pressure Zone
 System Expansion (2010-2015): 0.25 North Tank in the future North Pressure Zone
- Total Storage, for a particular year, is calculated by adding the Available Storage to the Additional Storage.



Upper Scenic Heights Tank

Modified water storage requirements were applied to the Scenic Heights Pressure Zone. During power outages or during a rupture of the single 6-inch supply line, this pressure zone relies on the existing 50,000-gallon tank for emergency (Figure 5.1). A reliability assessment of this pressure zone concluded that a modified storage requirement criteria, which would account for emergency storage, would be appropriate.

Since this is a residential area, fire storage for this zone was based on a 1,000 gpm fire flow for a duration of 2 hours, equating to 120,000 gallons. Emergency storage was based on fifty (50) percent times the maximum day demand conditions for this zone, equating to approximately 80,000 gallons. The total required storage capacity, including operational storage, is 300,000 gallons (Appendix A). It is therefore recommended that the existing 50,000-gallon tank be replaced with a new 300,000-gallon tank. Though a detailed site investigation is recommended, a preliminary site investigation indicates that the current tank site is acceptable for the replacement tank.

Rocky Hill and North Tanks

To meet daily operational water requirements and to provide adequate and reliable fire protection in the elevated proposed pressure zones, the following storage reservoirs are recommended.

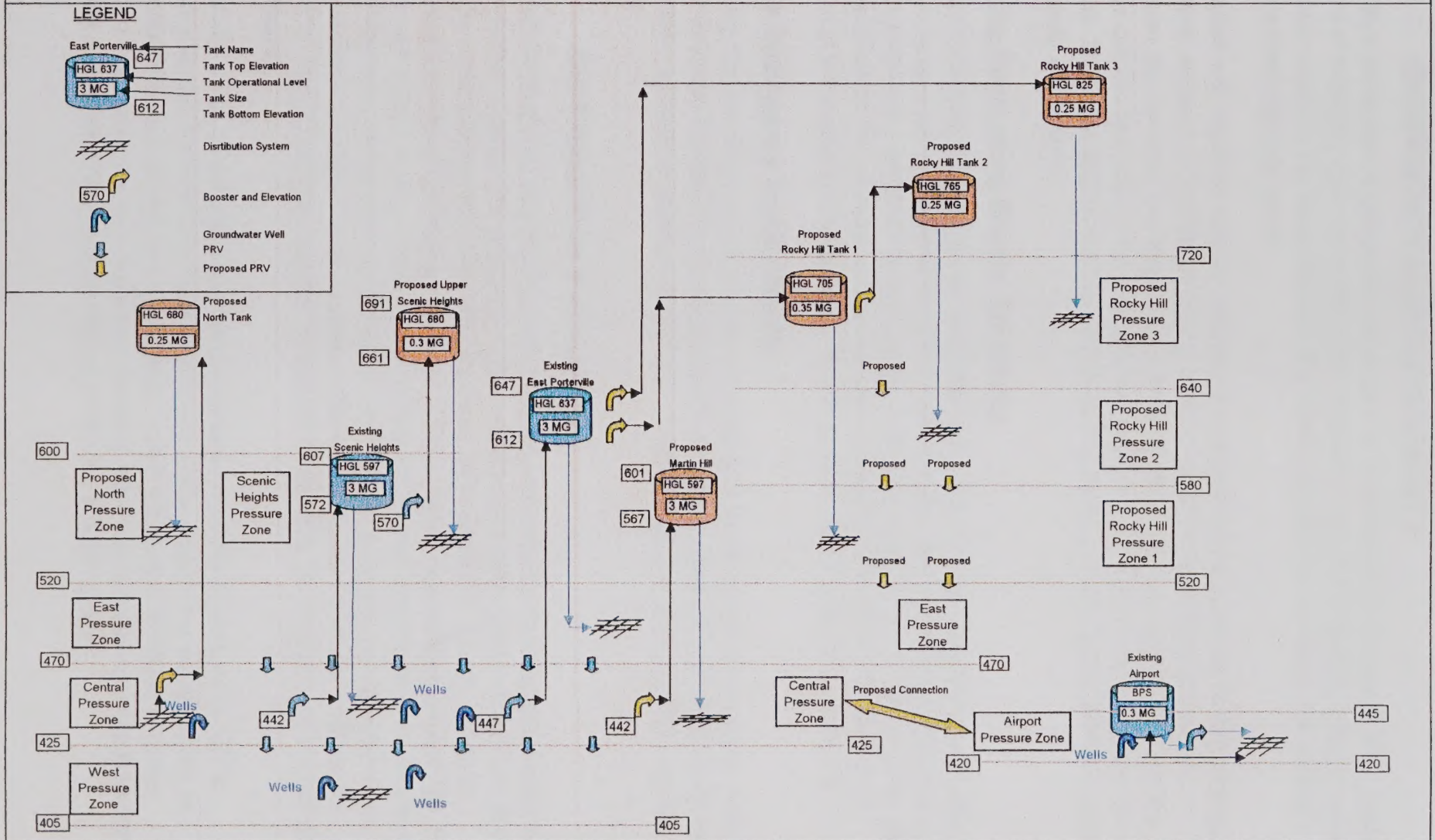
- 0.35 MG Rocky Hill Pressure Zone 1
- 0.25 MG Rocky Hill Pressure Zone 2
- 0.25 MG Rocky Hill Pressure Zone 3
- 0.25 MG North Pressure Zone

The Rocky Hill South Tank (Rocky Hill Pressure Zone 1) is proposed to be sited at an approximate elevation of 680 feet (hydraulic grade of 705 feet) and service the future Rocky Hill South Pressure Zone, between elevations 580 feet and 520 feet. The Rocky Hill Central Tank (Rocky Hill Pressure Zone 2) is proposed to be sited at an approximate elevation of 740 feet (hydraulic grade 765 feet), and service the future Rocky Hill Central Pressure Zone, between elevations 640 feet and 580 feet.

The Rocky Hill North Tank (Rocky Hill Pressure Zone 3) is proposed to be sited at approximately 800 feet (hydraulic grade of 825 feet) and service the future Rocky Hill North Pressure Zone, between elevations 720 feet and 640 feet. The North Pressure Zone Tank (north portion of system) is proposed to be sited at approximately 660 feet (hydraulic grade of 685 feet) and service elevations between 560 and 500 feet.

It is recommended that a preliminary design study be performed on the upper elevations to determine the most appropriate sites for these tanks. Figure 5.2 provides a proposed updated hydraulic profile that incorporates the new storage facilities, including the Rocky Hill Tanks.

Figure 5.2 Proposed Hydraulic Profile
City of Porterville Water System Master Plan



3.0 EMERGENCY SUPPLY CAPACITY

The City's production is completely dependent on its wells, which constitute one hundred percent of its supply capacity. In the event of an area-wide power outage, the only available City water supply is the water stored in the existing storage tanks, unless the wells are equipped with standby power.

Consistent with standard industry practice, the criteria that must be met during emergency conditions consists of providing a supply capacity equal to (fifty) 50 percent of the maximum day demand. The water stored in the existing tanks, as established with the storage criteria, can provide the City with twenty five (25) percent of the maximum day demand. The remaining twenty five (25) percent must be met with supply wells equipped with power generators.

Existing Emergency Supply Deficiency

It is recommended that emergency generators be purchased and installed at wells that provide the equivalent of 25 percent of the maximum day demand (3,500 gpm), plus a backup emergency generator to back up any wells that might be out of service. This can be accomplished by the purchase of four (4) new emergency generators that should be installed at the largest producing wells: Well Nos. C-17, C-20, C-22, C-24, or C-25.

Future Emergency Supply Needs

Assuming that the future supply source will continue to be additional groundwater wells, it is recommended that the City purchases a new emergency generator at every fourth well constructed, in order to continue to meet the minimum supply requirements during power failures.

4.0 DISTRIBUTION FACILITIES

Based on the evaluation criteria discussed in a previous chapter, the hydraulic model was used to further evaluate the adequacy of the existing distribution system. Maximum day demands, in conjunction with simulated fire flows, were applied at various locations throughout the network to "stress" the water system in the areas of the simulated fire. Only one fire was staged during a single model simulation, and the magnitude of the fire flow varied depending on the land use density or intensity. For example, during simulations within the Scenic Heights Pressure Zone, 1,000 and 1,500 gpm fires were staged. To account for higher demands required by the industrial areas, fire flows of up to 3,500 gpm were staged.

Additionally, a risk assessment was performed at the wells by shutting wells "off" to simulate potential malfunctions. During these scenarios, maximum hour demands, in conjunction with a single fire flow, were staged within the sphere of influence of the simulated malfunctioning well. Peak hour demands were also simulated to exert the highest projected normal water demand conditions on the entire water system.

Booster Stations

The East Porterville Booster Station, which draws water from the Central Pressure Zone to fill the 3 MG East Porterville Tank, currently operates during off peak hours. With a total dynamic head (TDH) of 140 feet, this booster station is sized properly to fill the tank.

The Scenic Heights Booster Station, which draws water from the Central Pressure Zone to fill the 3 MG Scenic Heights Tank, also operates during off peak hours. The existing booster pumps have a TDH of 45 feet. This seems a little low and dictates that the inlet pressures in the Central Pressure Zone be maintained above 50 psi for proper operation. Therefore, this booster station cannot operate appropriately during peak hour conditions, when the Central Pressure Zone pressure drops below 45 psi. A strategy of operating this booster station during off peak periods mitigates this limiting condition, and at the same time, enhances energy use.

The Upper Scenic Heights Booster Station, which draws water from the 3 MG Scenic Heights Tank to fill the 50,000 gallon Upper Scenic Heights Tank operates based on the levels in the Upper Scenic Heights Tank. The existing booster pumps have a TDH of 100 feet. Filling the Upper Scenic Heights Tank will require that the water levels in the 3 MG Scenic Heights Tanks be above 594 feet. The current low level setting in the 3 MG Scenic Heights Tank is 582 feet.

Existing Distribution Deficiencies

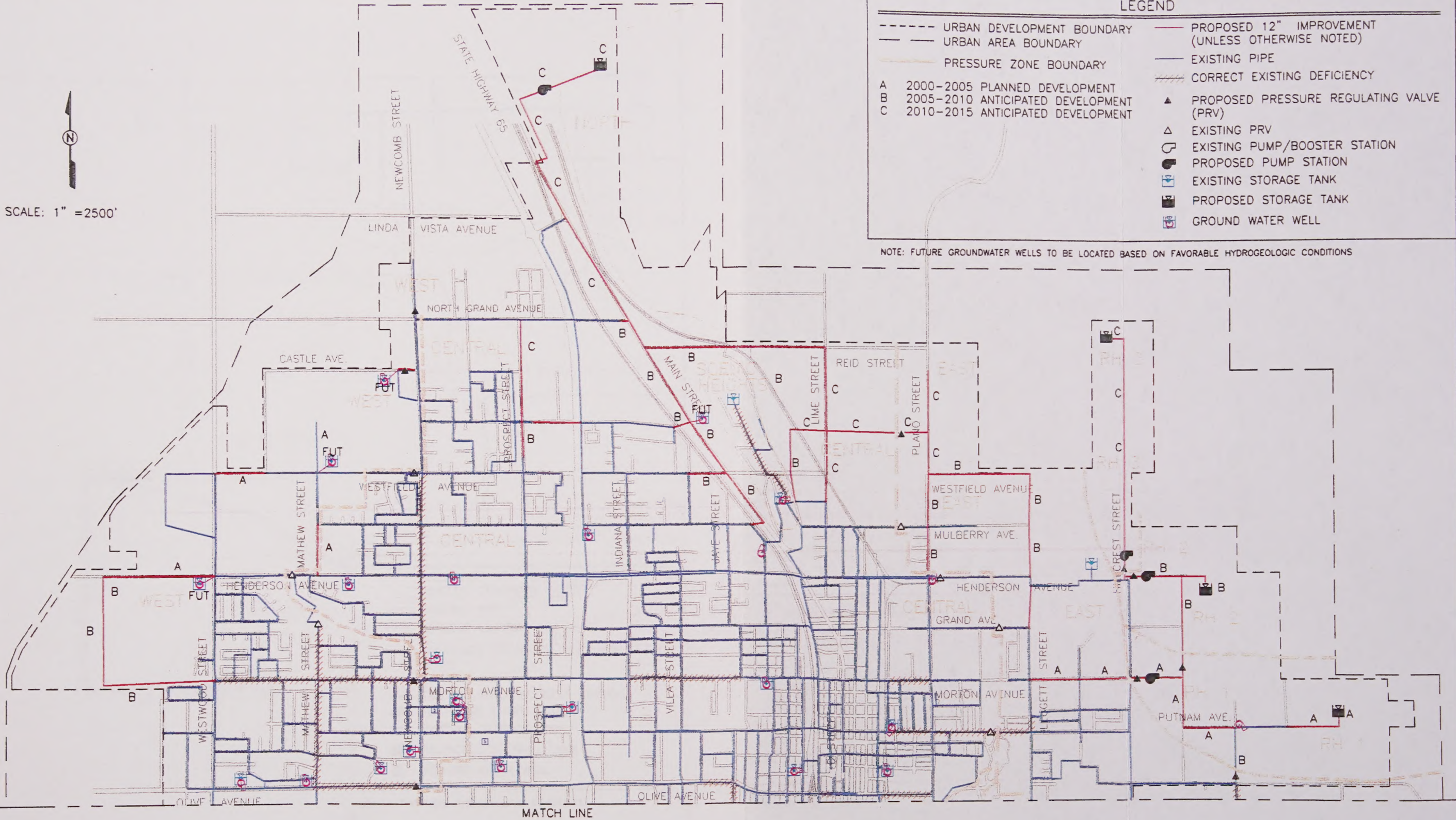
Based on computer hydraulic analysis and the evaluation criteria discussed in the previous section, deficiencies in the distribution system were identified and described, by pressure zone. The recommended improvements (Figure 5.3) are needed for enhancing system operation and reliability. They are discussed in this section and they are quantified in the capital improvement program, which is presented in a following chapter.

East Porterville PRV

There are two existing pressure reducing valves (PRVs) inside the East Porterville Booster Pump Station located southeast of the Henderson Avenue and Plano Street intersection. When the booster pumps are turned off, these PRVs (12-inch and 6-inch) allow water to flow back from the East Pressure Zone to the Central Pressure Zone, along the 16-inch transmission main on Henderson Avenue. City staff indicated that these PRVs are currently non operational, and requested a review of the functionality of the PRVs.

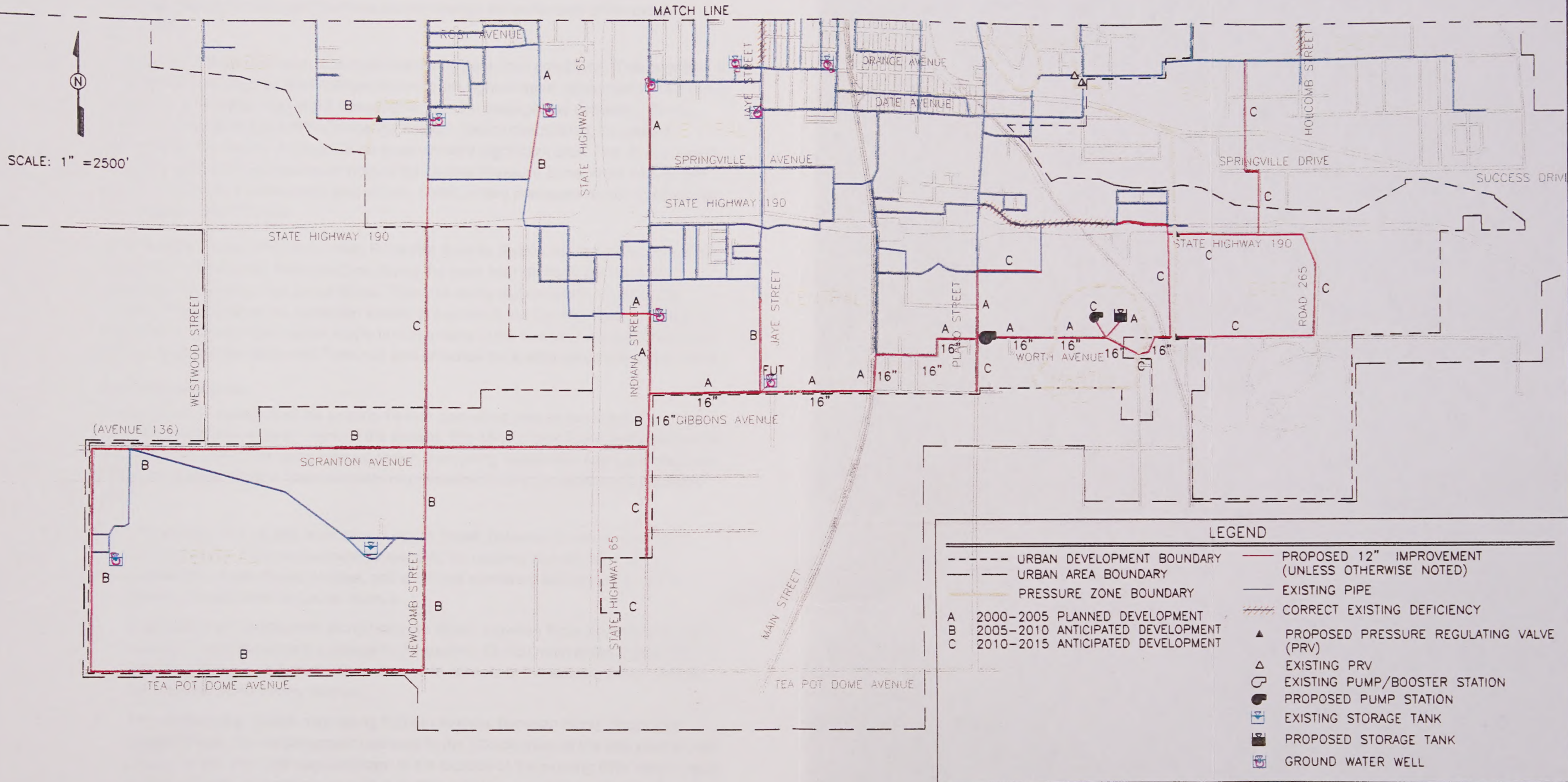
Consequently, simulation runs were conducted with the PRVs deactivated to determine the impact of the current malfunction. The simulations indicate that during normal system conditions (i.e. average day demand), and during maximum day conditions (i.e. maximum day demand in summer time), the Central Pressure Zone will be operating with acceptable system-wide pressures, provided that all the currently operational City wells, listed in Table 4-3, are active. The PRVs were then activated for these simulations resulting in no

SCALE: 1" = 2500'



FEBRUARY 2001





NOTE: FUTURE GROUNDWATER WELLS TO BE LOCATED BASED ON FAVORABLE HYDROGEOLOGIC CONDITIONS

significant impact or enhanced pressures in the Central Pressure Zone. Additionally, applying localized and staged fire flows did not change the conclusion of the previous simulations.

A significant impact, however, was observed during peak hour conditions. This condition is hypothetical and projects water demands during the highest water consumption hour (most likely in a hot weather day) at 3.4 times higher than the average day demands. During these simulations with the PRVs inside the Booster Station deactivated, the overall pressures in the Central Pressure Zone experienced a significant drop. The drop is more pronounced in the south-southeast area of the Central Pressure Zone, more specifically south of Henderson Avenue and east of Jaye Street, where pressures dropped below the acceptable levels of 30 psi.

Activating the 12-inch PRV in the East Porterville Booster Station will enhance the overall pressures in the Central Pressure Zone during the peak hour demand condition and maintain system pressures above 40 psi. Thus, this study recommends repairing the 12-inch PRV, as it provides enhanced system pressures to the Central Pressure Zone. It should be noted that other future supply improvements in the Central Pressure Zone, such as new wells and the Martin Hill Tank, will also enhance the system pressures in that zone.

East Pressure Zone

The simulations indicate that the existing 16-inch pipe along Henderson Avenue is one of the most critical transmission mains in the system. The 16-inch pipe is the backbone of the East Pressure Zone, first along Hillcrest Street, then along Henderson Avenue to the East Porterville Booster Station. Improvements recommended in this pressure zone are listed below.

- The addition of a 12-inch main along Leggett Street, between Grand Avenue and Laurel Avenue. This improvement connects to the existing 12-inch main at the intersection of with Grand Avenue, and continues northward and connects to the existing 16-inch main on Laurel Avenue.
- The addition of 12-inch main along Holcomb Street, between Roby Avenue and Olive Avenue. This improvement connects to the existing 12-inch main at the intersection with Olive Avenue and continues southward to connect to the existing 8-inch main at the intersection with Roby Avenue.
- The addition of a 12-inch main along Putnam Avenue, between Henry Street and Leggett Street. This improvement connects to the 12-inch main at the intersection with Leggett Street and continues westward to the location of the existing PRV station, east of Henry Street. In addition a new 10-inch PRV will be required to replace the existing PRV.
- The addition of a 12-inch main along Leggett Street, between Putnam Avenue and north of Cleveland Avenue. This improvement connects to the existing 12-inch main

on Putnam Avenue and continues northward to connect to the existing 12-inch main, approximately located 200 feet north of the intersection with Cleveland Avenue.

Central Pressure Zone

The simulations indicate that the eastern portion of this zone has a weaker network due to the reliance, in some areas, on 8-inch mains. Reinforcing this network is especially important since it will enhance flows from the East Pressure Zone and from Well Nos 1 and 11. Additionally, reinforcements with 12-inch mains in the northwest portion of this zone is important since that area has few or no supply wells. Other improvements, located in the southwest and central areas of this zone are also listed.

- The addition of 12-inch main along Morton Avenue, between Plano Street and Third Street. The improvement connects to the proposed 12-inch main on Plano Street and continues westward to connect to the existing 10-inch main on Third Street.
- The addition of 12-inch main along Putnam Avenue, between Fourth Street and Henry Street. This improvement connects to the existing 10-inch main on Fourth Street and continues eastward, crossing Plano Street, to the existing PRV east of Henry Street.
- The addition of 12-inch main along Olive Avenue, between Plano Street and Second Street. This improvement connects to the proposed 12-inch main on Plano Street and continues westward to the existing 12-inch main at the intersection with Second Street.
- The addition of 12-inch main along Olive Avenue, between D Street and E Street. This improvement connects to the existing 12-inch main on D Street and continues westward, crossing under the existing Railroad, and finally connects to the existing 12-inch main on E Street.
- The addition of 12-inch main along Jaye Street, between Olive Avenue and Union Avenue. This improvement connects to the existing 12-inch main at the intersection with Olive Avenue, and continues southward and connects to the existing 12-inch main at the intersection with Union Avenue.
- The addition of 12-inch main along Olive Avenue, between Jaye Street and Carmelita Street. This improvement connects to the existing 12-inch main at the intersection with Jaye Street, and continues westward to connect to the existing 12-inch main at the intersection with Carmelita Street.
- The addition of 12-inch main along Morton Avenue, between Indiana Street and Palm Street. This improvement connects to the existing 12-inch main at the intersection with Indiana Street and continues eastward to the intersection with Palm Street where it connects with an existing 10-inch main.
- The addition of 12-inch main along Indiana Street, between Union Avenue and Springville Avenue. This improvement connects to the existing 12-inch main at the intersection with Union Avenue and continues southward, crossing the Tule River, to connect to the existing 8-inch main at the intersection with Springville Avenue.

- The addition of 12-inch main along Prospect Street, between Westfield Avenue and North Grand Avenue. This improvement connects to the existing 12-inch main at the intersection with North Grand Avenue and continues southward and connects to the existing 8-inch main at the intersection with Westfield Avenue.
- The addition of 12-inch main along Pioneer Avenue, between east of Prospect Avenue and the east side of Highway 65. This improvement connects to the existing 12-inch main east of Prospect Avenue at the Westfield Elementary School and continues eastward, crossing Highway 65 and connects to the existing 12-inch main on the other side of the highway.
- The addition of 12-inch main along Newcomb Street, between Morton Avenue and Westfield Avenue. This improvement connects to the existing 12-inch main at the intersection of Morton Avenue and continues northward and connects to the existing 12-inch main at the intersection with Westfield Avenue.
- The addition of 8-inch main along Highland Drive, between the 3 MG Scenic Heights Tank and the proposed 0.3 MG Upper Scenic Heights Tank. This improvement will replace the existing 6-inch main connecting the two tank locations.

West Pressure Zone

The West Pressure Zone system, consisting of small production supply wells with mostly 6-inch mains, was acquired by the City from another water company. Since the acquisition, the City has enhanced the operation and reliability of the system by constructing larger wells and by providing interconnections with the Central Pressure Zone. This study recommends the City continues to reinforce the water network in this zone with the following projects.

- The addition of 12-inch main along Morton Avenue, between Newcomb Street and Westwood Street. This improvement connects to the existing 12-inch main at the intersection with Newcomb Street, and continues westward to connect to the existing 12-inch main at the intersection with Westwood Street. This improvement will require a new 10-inch PRV.
- The addition of 12-inch main along Mathew Street, between Morton Avenue and Olive Avenue. This improvement connects at the proposed 12-inch main on Morton Avenue, and continues southward to connect to the existing 12-inch main at the intersection with Olive Avenue.
- The addition of 12-inch main along Olive Avenue, between Newcomb Street and Mathew Street. This improvement connects to the existing 12-inch main at the intersection with Newcomb Street and continues westward to connect to the existing 12-inch main at the intersection with Mathew Street. This improvement will require a new 10-inch PRV.

Future Distribution Expansion

As the City grows and expands, new distribution mains will be required to serve the new developments (Figure 5.3). In general, the proposed expansion improvements consist of a grid distribution system with 12-inch mains spaced every one-half mile, and 8-inch mains spaced every one-quarter mile. The improvements are planned based on the growth staging identified by City staff (Figure 2.2). For master planning purposes, alignments of expansion mains were assumed to extend along the alignment of existing streets. The future expansions will also necessitate the creation of new pressure zones to service the higher elevations, as shown on the proposed hydraulic profile on Figure 5.2.

East Pressure Zone

This zone will expand to the north along Plano Street to Reid Street, and eastward along Mulberry Avenue. A 12-inch main grid expansion is therefore recommended along these streets. Additionally, two new 10-inch PRVs will be needed to connect the expanding distribution system in this zone with the proposed expanding distribution system of the Central Pressure Zone. More specifically, a PRV will be needed east of Plano Street, along the extension of Pioneer Avenue.

Additionally, this zone has the potential to expand to the southeast portion of the City, north of State Highway 190 and east of Hillcrest Street. Growth in this area will require a 12-inch main along Conner Street, between Roby Avenue and Springville Avenue. The new main will then jog to Walnut Street and continue southward, crossing the Tule River first, then State Highway 190 and connecting to this expansion area. Two new PRVs will be needed in this expansion area, with the first tentatively sited near the intersection of the Hillcrest Street extension, south of State Highway 190. The second PRV is sited near the intersection of the Hillcrest Street extension and Worth Avenue.

Central Pressure Zone

One of the most significant improvements to the Porterville water system will be the addition of the proposed Martin Hill tank in the south portion of this zone. The proposed new tank will include a 16-inch transmission main from the proposed location on Martin Hill, and along Worth Avenue to the intersection with Plano Street. The 16-inch transmission main continues north along Plano Street and connects to the existing 12-inch main at College Avenue. The 16-inch main will also continue westward along Gibbons Avenue, between Plano Street and Indiana Street. A series of proposed 12-inch mains will connect this transmission main with the remaining distribution system in that area.

The previously described 16-inch transmission main becomes a supply line for incorporating the Airport Pressure Zone into the Central Pressure Zone. This is accomplished by connecting the proposed 12-inch main grid system within the Airport Pressure Zone with the 16-inch main on Gibbons Avenue. No PRVs will be required since the elevations within that zone are consistent within the elevations serviced by the Central Pressure Zone.

The southwest expansion area of this zone, specifically west of State Highway 65 and south of Olive Avenue, will require new 12-inch mains along the Prospect Street extension. The new main will continue southward along the Prospect Street alignment, crossing the Tule River to connect to the existing 12-inch main on the north side of State Highway 190. Another 12-inch main will be required along the Date Avenue alignment, between Newcomb Street and the Prospect Street alignment.

The northeast expansion area of this zone will include 12-inch mains along Main Street, Reid Street, Lime Street, and Pioneer Avenue, and will connect to the expanding East Pressure Zone. The north expansion area of this zone, north of Linda Vista Avenue, will consist of a 12-inch main, looped along the future street alignment in that area.

West Pressure Zone

As this area expands westward to the Friant-Kern Canal, a series of 12-inch main grids are proposed to serve the future developments. The proposed 12-inch mains will extend from the existing extremities of the network, and continue westward or northward, within the expansion areas, along Castle Avenue, Mathew Street, Westfield Avenue, Henderson Avenue, Morton Avenue, Westwood Street, and others.

In the southern portion of this area, a new 12-inch main will be needed along the Date Street alignment, between Newcomb Street and Mathew Street. This new main will connect to the existing 12-inch main at the intersection with Newcomb Street and include a 10-inch PRV to transition from the Central Pressure Zone.

Airport Pressure Zone

As the growth occurs at the Airport, the distribution system piping will extend from the existing supply source to the new developments. The distribution piping required to serve that area consists of 12-inch grid mains along Westwood Street, Tea Pot Dome Avenue, Newcomb Street, Scranton Avenue, and Indiana Street. It is recommended that this pressure zone be incorporated with the Central Pressure Zone by connecting it with the proposed 16-inch main on Gibbons Avenue. Another 12-inch main along Newcomb Street, between Scranton Avenue and State Highway 190, will add reliability to the connection between the Airport Pressure Zone and the Central Pressure Zone.

Proposed Rocky Hill South Pressure Zone

This proposed pressure zone will service future developments at elevations higher than those serviced by the East Pressure Zone. It is proposed that a storage tank for this zone be sited on Rocky Hill, east of Conner Street and north of Putnam Avenue, at an elevation of approximately 680 feet. The serviced elevations will range from 520 feet to 580 feet. A booster station, tentatively sited east of the intersection between Morton Avenue and Hillcrest Street, will extract water from the existing 16-inch main along Hillcrest Street to the proposed 0.35 MG Rocky Hill South Tank.

The associated distribution piping in this zone includes a new 12-inch transmission main that starts at the intersection with Hillcrest Street, and continues along Morton Avenue in an

easterly direction to Holcomb Street. The new 12-inch main then continues in a southerly direction along Holcomb Street to the intersection with Putnam Avenue, where it turns eastwardly and continues along Putnam to the location of the proposed tank site. Two new 10-inch PRVs are proposed to divide this zone from the East Pressure Zone.

Proposed Rocky Hill Central Pressure Zone

This proposed pressure zone will also service future developments at elevations higher than those serviced by the East Pressure Zone. It is proposed that a storage tank be sited on Rocky Hill, east of Hillcrest Street and along the alignment with Henderson Avenue, at an elevation of approximately 740 feet. The serviced elevations will range from 580 feet to 640 feet. A booster station, tentatively sited east of the intersection of Hillcrest Street and Henderson Avenue, will extract water from the existing 16-inch main along Henderson Avenue to the proposed 0.25 MG Rocky Hill Central Tank.

The associated distribution piping in this zone includes a new 12-inch transmission main that starts at the intersection with Hillcrest Street, and continues along Henderson Avenue in an easterly direction to the location of the proposed tank site. One new 10-inch PRV is proposed to divide this zone from the East Pressure Zone. Another PRV will be needed should this zone become connected to the Proposed Rocky Hill South Pressure Zone.

Proposed Rocky Hill North Pressure Zone

This proposed pressure zone will also service future developments at elevations higher than those serviced by the East Pressure Zone. It is proposed that a storage tank be sited on Rocky Hill, along the street extension of Hillcrest Street and north of the alignment with Reid Street, at an elevation of approximately 800 feet. The serviced elevations will range from 640 feet to 720 feet. A booster station, tentatively sited north of the intersection of Hillcrest Street and Henderson Avenue, will extract water from the existing 16-inch main along Henderson Avenue to the proposed 0.25 MG Rocky Hill North Tank.

The associated distribution piping in this zone includes a new 12-inch transmission main that starts at the intersection with Henderson Avenue, and continues along Hillcrest Street to the location of the proposed tank site. One new 10-inch PRV is proposed to divide this zone from the East Pressure Zone. Another PRV will be needed should this zone become connected to the Proposed Rocky Hill Central Pressure Zone.

Proposed North Pressure

This proposed pressure zone will service future developments in the northeast portion of the City. The proposed new tank will include a 12-inch transmission main with an alignment that should generally follow future residential streets. The new 0.25 MG tank is proposed to be sited at an approximate elevation of 660 feet (hydraulic grade of 685 feet) and service elevations between 560 feet and 500 feet. One new 10-inch PRV is proposed to divide this zone from the Central Pressure Zone.

Chapter 6

CAPITAL IMPROVEMENT PROGRAM

This chapter presents the recommended Capital Improvement Program (CIP) for the City of Porterville water distribution system. The program is based on the evaluation of the Porterville water distribution system, and on the recommended projects described in the previous chapter. The CIP has been staged to the planning horizon year 2015.

1.0 COST ESTIMATING ACCURACY

The cost estimates presented in this study are developed from Porterville bid tabulations, cost curves, information obtained from previous studies, and Carollo Engineers experience on other projects. The American Association of Cost Engineers defines three types of cost estimates:

- An Order of Magnitude Estimate for Master Plan Studies. This is an approximate estimate made without detailed engineering data. It is normally expected that an estimate of this type would be accurate within +50 percent to -30 percent.
- A Budget Estimate for Predesign Study. A budget estimate is prepared with the use of flow sheets, layouts, and equipment details. It is normally expected that an estimate of this type would be accurate within +30 percent to -15 percent.
- A Definite Estimate (Engineer's Estimate) for Time of Contract Bidding. This estimate is prepared from very defined engineering data. The data includes fairly complete plot plans and elevations, soil data, and a complete set of specs. It is expected that a definite estimate would be accurate within +15 to -5 percent.

Costs developed for this study should be considered "order of magnitude" and have an expected accuracy range of +50 percent to -30 percent.

2.0 COST ESTIMATING CRITERIA

The cost estimates presented in the Capital Improvement Program (Table 6-1) have been prepared for general master planning purposes and for guidance in project evaluation and implementation. Final costs of a project will depend on actual labor and material costs, competitive market conditions, final project scope, implementation schedule, and other variable factors such as: preliminary alignments generation, investigation of alternative routings, and detailed utility and topography surveys.

The capital costs do not include pipeline corridor purchases or easement costs because it was assumed that public right-of-way will be utilized wherever possible. As a result, the final capital and operating costs will vary from the estimates presented herein.

The construction costs in Table 6.1 were adjusted to reflect an Engineering News Record (ENR) construction cost index of 6367, representing costs for lower San Joaquin Valley.

This ENR index was derived from the average of the November 1998 construction cost index for the San Francisco area (ENR 6775), and the 20-Cities Average (ENR 5960).

3.0 CAPITAL IMPROVEMENT PROGRAM DEVELOPMENT

Detailed explanations for the development of the Capital Improvement Program, as presented in Table 6.1, are provided in this section. Care was taken to explain each column, in the order of its appearance in the table.

General Information

Type of Improvement: storage tanks, wells, pipelines, booster stations, pressure reducing valves (PRVs), jacked steel casings (STCS), and standby emergency power generators (EPG).

Street Description: A street description in which the improvement is proposed.

Limits: Limits that generally describe the beginning and end of a proposed project. This column is most useful when describing pipeline projects.

Pressure Zone: Pressure zone which the improvement will be servicing.

Proposed Facilities & Appurtenance Costs

Diameter: Diameter of the proposed pipe, in inches

Length: Estimated length of the proposed improvement, in feet. It should be noted that the lengths estimates account for jogs necessary for crossing major obstructions such as a river or a railroad. However, it does not account for jogs that might be necessary for avoiding unknown conditions.

Pipe Unit Cost: Estimated unit cost of pipeline is based on the pipe's present day cost in addition to installation cost, new pavement or pavement restoration, traffic control, bore-and-jack installation (where applicable), and appurtenance such as valves and fire hydrants, mobilization and demobilization, and contractor's overhead and profit. The cost is expressed in dollars per linear foot (\$/LF) of pipe length. In the case of jacked steel casings, the unit cost includes the carrier pipe inside the casing.

Other Infrastructure Facilities Costs: Estimated lump sum costs, in dollars, for the construction of infrastructure utilities, other than pipes. Wells, storage tanks, booster pump stations, pressure reducing valves, and emergency generators.

Baseline Construction Cost

This is the total estimated construction cost, in dollars, of the proposed improvement: pipes, wells, tanks, booster stations, PRVs, or emergency generators.

Estimated Construction Cost

Since knowledge about site-specific conditions of each proposed project is limited at the master planning stage, a fifteen (15) percent contingency was applied to the Baseline Construction Cost to account for unforeseen events and unknown conditions.

The Estimated Construction Cost, in dollars, for the proposed improvement consists of the Baseline Construction Cost plus the construction contingency.

Capital Improvement Cost

Other project-related costs have been identified and estimated at fifteen (15) percent of the Estimated Construction Costs. These costs include engineering, administration, construction inspection, and legal costs.

The Capital Improvement Cost, in dollars, for each proposed improvement is the total of the Estimated Construction Cost (including contingency) plus the other costs discussed in the previous paragraph.

4.0 WATER CONNECTION FEES ANALYSIS

Connection fees are charges, imposed by local agencies on new developments, for recovering the capital costs of public facilities needed to service those developments. These fees and charges must satisfy the provisions of California Government Code Section 66000 which went into effect on January 1, 1989. These provisions, for water and sewer connection fees, are also known as AB1600 provisions, referring to Assembly Bill 1600 that introduced the provision. The provisions, as they relate to water and sewer connection fees, dictate that the "... charges do not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed...".

In 1990, the City Council adopted the 1989 Water Master Plan, which contains water connection fees required from developers for covering the cost of the proposed water utility infrastructure projects. Revenues generated from these fees are placed in the Water Development Fund, which is used exclusively for the construction of water system facilities, in accordance with Government Code Section 66000 and City Code Section 19A-40. Additionally, City staff adjust the fees annually in accordance with the Engineering News Record Construction Cost Index (ENR), as provided in Ordinance No. 1440.

In October 1997, the City retained Carollo Engineers to update both the water and sewer master plans and develop capital improvement programs for the revised urban area boundary. In order to continue to meet the intent of AB 1600, the City also requested that

Table 6.1 Capital Improvement Program City of Porterville Water System Master Plan
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Type of Improv.	Street	Limits	Pressure Zone	Pipeline and Appurtenances Costs				Other Infrastr. Costs	Baseline Constr. Cost	Estimated Constr. Cost ²	Capital Improv. Cost ³
				Diameter (in)	Length (ft)	Unit Cost (\$)	Pipe Cost (\$)				
Improvements to Correct Existing Deficiencies - Central Pressure Zone											
Generator		Location to be determined by City	n/a					50,000	50,000	57,500	66,000
Generator		Location to be determined by City	n/a					50,000	50,000	57,500	66,000
Generator		Location to be determined by City	n/a					50,000	50,000	57,500	66,000
Generator		Location to be determined by City	n/a					50,000	50,000	57,500	66,000
Generator		Location to be determined by City	n/a					50,000	50,000	57,500	66,000
Well	No. 26	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Well	No. 27	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Well	No. 28	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Well	No. 29	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Well	No. 30	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Pipe	Putnam Ave	Plano St to Fourth St	Central	12	1,400	42	58,800		58,800	67,620	78,000
Pipe	Putnam Ave	Plano St to Henry St	Central	12	1,320	42	55,440		55,440	63,756	73,000
PRV	Putnam Ave	at Henry St	Central	12				15,000	15,000	17,250	20,000
Pipe	Olive Ave	Plano St to Second St	Central	12	2,100	42	88,200		88,200	101,430	117,000
Pipe	Newcomb St	Westfield Ave to Henderson Ave	Central	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	Newcomb St	Henderson Ave to Morton Ave	Central	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	Pioneer Ave	Prospect St to St Highway 65	Central	12	1,200	42	50,400		50,400	57,960	67,000
Casing	Pioneer	Cross HWY 65	Central	12	60	336	20,160		20,160	23,184	27,000
Pipe	Morton Ave	Indiana St to Palm St	Central	12	2,800	42	117,600		117,600	135,240	156,000
Pipe	Morton Ave	Third St to Plano St	Central	12	1,075	42	45,150		45,150	51,923	60,000
Pipe	Jaye St	Union Ave to Olive Ave	Central	12	2,000	42	84,000		84,000	96,600	111,000
Pipe	Olive Ave	"D" St to "E" St	Central	12	375	42	15,750		15,750	18,113	21,000
Pipe	Olive Ave	Carmelita St to Jaye St	Central	12	900	42	37,800		37,800	43,470	50,000
Pipe	St Highway 190	Plano St to Santa Fe Railroad	Central	12	3,000	42	126,000		126,000	144,900	167,000
Pipe	St Highway 190	Santa Fe Railroad to ext. Ruth St.	Central	12	2,640	42	110,880		110,880	127,512	147,000
											4,198,000
Improvements to Correct Existing Deficiencies - East Pressure Zone											
Pipe	Holcomb St	Olive Ave to Roby Ave	East	12	1,320	42	55,440		55,440	63,756	73,000
Pipe	Legget St	Putnam Ave to Cleveland Ave	East	12	600	42	25,200		25,200	28,980	33,000
Pipe	Putnam Ave	Henry St to Legget St	East	12	1,320	42	55,440		55,440	63,756	73,000
											179,000

Table 6.1 Capital Improvement Program
City of Porterville Water System Master Plan

Type of Improv.	Street	Limits	Pressure Zone	Pipeline and Appurtenances Costs				Other Infrastr. Costs (\$)	Baseline Constr. Cost (\$)	Estimated Constr. Cost ² (\$)	Capital Improv. Cost ³ (\$)
				Diameter (in)	Length (ft)	Unit Cost (\$)	Pipe Cost (\$)				
Improvements to Correct Existing Deficiencies - Scenic Heights Pressure Zone											
Tank	Upper Scenic Heights	Replace existing tank (0.05 to 0.3 mg)	Scenic Heights					300,000	300,000	345,000	397,000
Tank	Highland Drive	Demolition of existing tank	Scenic Heights					50,000	50,000	57,500	66,000
Pipe	Highland Drive	3.0 MG Scenic Heights Tank to upper tank	Scenic Heights	10	3,100	80	248,000		248,000	285,200	328,000
											791,000
Improvements to Correct Existing Deficiencies - West Pressure Zone											
Pipe	Morton Ave	Newcomb St to Mathew St	West	12	2,640	42	110,880		110,880	127,512	147,000
PRV	Morton Ave	West of Newcomb	West	12				15,000	15,000	17,250	20,000
PRV	Newcom St.	n/o North Grand Ave. and w/o Newcomb	West	2 x 12				30,000	30,000	34,500	40,000
Pipe	Morton Ave	Mathew St to Westwood St	West	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	Mathew St	Morton Ave to White Chapel Ln.	West	12	1,320	42	55,440		55,440	63,756	73,000
PRV	Mathew St	s/o White Chapel	West	12				15,000	15,000	17,250	20,000
Pipe	Mathew St	Morton Ave to Olive Ave	West	12	2,640	42	110,880		110,880	127,512	147,000
											594,000
Expansion Improvements (2000 - 2005)											
Well	No. 31	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Well	No. 32	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Tank	Rocky Hill 1 Tank	0.35 MG (HGL = 705 feet)	Rocky Hill 1					400,000	400,000	460,000	529,000
Pump Stat ¹	Rocky Hill 1 PS	Morton Ave e/o Hillcrest St (2 x 650 gpm)	Rocky Hill 1					170,000	170,000	195,500	225,000
PRV	Holcomb St, ext	Morton Ave, e/o Hillcrest	Rocky Hill 1 - East	12				15,000	15,000	17,250	20,000
Pipe	Putnam Ave	Tulsa St to Rocky Hill 1 Tank	East	12	1,250	42	52,500		52,500	60,375	69,000
Pipe	Morton Ave	Leggett St to Hillcrest St.	East	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	Morton Ave, ext	Hillcrest St. to ext Conner St	East	16	1,320	56	73,920		73,920	85,008	98,000
Pipe	Conner St. ext.	Morton Ave. to Putnam Ave.	East	16	1,320	56	280,000		280,000	322,000	370,000
Pipe	Putnam Ave	Conner St. ext. to Holcomb St.	East	16	1,320	56	280,000		280,000	322,000	370,000
Pipe	Indiana St	Union Ave to Springville Ave	Central	12	2,640	42	110,880		110,880	127,512	147,000
Casing	Indiana St	Cross Tule River	Central	12/24	300	336	100,800		100,800	115,920	133,000
Pipe	Mathew St	Mulberry St to Henderson Ave	Central	12	1,320	42	55,440		55,440	63,756	73,000
Tank	Martin Hill Tank	3.0 MG Martin Hill Tank	Central					1,500,000	1,500,000	1,725,000	1,984,000
Pump Stat ¹	Martin Hill PS	Worth Av. e/o Plano St.	Central					200,000	200,000	230,000	265,000
Pipe	Worth Ave	Golden Hill Rd to Martin Hill Tank	Central	16	1,200	56	67,200		67,200	77,280	89,000
Pipe	Worth Ave	Plano St to Golden Hill Rd.	Central	16	1,900	56	106,400		106,400	122,360	141,000
Pipe	Gibbons Ave	Indiana St to Jaye St	Central	16	2,640	56	147,840		147,840	170,016	196,000
Pipe	Gibbons Ave	Jaye St to Main St	Central	16	2,640	56	147,840		147,840	170,016	196,000

Table 6.1 Capital Improvement Program
City of Porterville Water System Master Plan

Type of Improv.	Street	Limits	Pressure Zone	Pipeline and Appurtenances Costs				Other Infrastr. Costs (\$)	Baseline Constr. Cost (\$)	Estimated Constr. Cost ² (\$)	Capital Improv. Cost ³ (\$)
				Diameter (in)	Length (ft)	Unit Cost (\$)	Pipe Cost (\$)				
Casing	Gibbons Ave	crossing Railroad	Central	16/26	60	364	21,840		21,840	25,116	29,000
Pipe	Main St.	Gibbons Ave. to Yates/Worth Ave.	Central	16	1,000	56	56,000		56,000	64,400	74,000
Pipe	Yates/Worth Ave.	Main St to Plano St	Central	16	3,000	56	168,000		168,000	193,200	222,000
Pipe	Plano St	College Ave to Worth Ave	Central	12	1,600	42	67,200		67,200	77,280	89,000
Pipe	Brown Ave, ext	Wisconsin St to Indiana St	Central	12	450	42	18,900		18,900	21,735	25,000
Pipe	Indiana St	ext Brown Ave to Gibbons Ave	Central	12	2,640	42	110,880		110,880	127,512	147,000
Casing	Indiana St	Cross Porter Slough	Central	12/24	150	336	50,400		50,400	57,960	67,000
Pipe	Henderson Ave	Westwood St to ext Road 222	West	12	1,320	42	55,440		55,440	63,756	73,000
Pipe	Westfield Ave	Westwood St to Lombardi St.	West	12	1,320	42	55,440		55,440	63,756	73,000
											6,843,000
Expansion Improvements (2005 - 2010)											
Generator		Location to be determined by City	n/a					50,000	50,000	57,500	66,000
Well	No. 33	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Well	No. 34	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Well	No. 35	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Well	No. 36	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Pipe	Legget St, ext	Henderson Ave to Westfield Ave	East	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	Legget St, ext	Grand Ave to Laurel Ave	East	12	1,200	42	50,400		50,400	57,960	67,000
Pipe	Plano St.	Henderson Ave. to Mulberry Ave	East	12	1,320	42	55,440		55,440	63,756	73,000
Pipe	Plano St	Mulberry Ave to Westfield Ave	East	12	1,320	42	55,440		55,440	63,756	73,000
Pipe	Westfield Ave	Plano St to Leggett	East	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	Conner St, ext	ext Morton Ave to Putnam Ave	Rocky Hill 2	12	1,320	42	55,440		55,440	63,756	73,000
Tank	Rocky Hill 2 Tank	0.25 MG (HGL = 765 feet)	Rocky Hill 2					300,000	300,000	345,000	397,000
Pump Stat ¹	Rocky Hill 2 PS	E. of Hillcrest St (2 x 500 gpm)	Rocky Hill 2					110,000	110,000	126,500	145,000
Pipe	Henderson Ave	Hilcrest St. to Rocky Hill 2 Tank	Rocky Hill 2	12	3,960	42	166,320		166,320	191,268	220,000
Pipe	Conner St, ext	Henderson Ave to Morton Ave	Rocky Hill 2	12	2,640	42	110,880		110,880	127,512	147,000
PRV	ext. Conner St.	from Rocky Hill 2 Zone	Rocky Hill 1-2	12				15,000	15,000	17,250	20,000
Casing	Main St	Cross Southern Pacific Railroad	Central	12/24	60	336	20,160		20,160	23,184	27,000
Pipe	Main St	Mulberry Ave to Reid St	Central	12	5,280	42	221,760		221,760	255,024	293,000
Pipe	Main St	Reid St to North Grand Ave	Central	12	800	42	33,600		33,600	38,640	44,000
Pipe	Reid St	Main St to Lime St.	Central	12	5,280	42	221,760		221,760	255,024	293,000
Pipe	East of Scenic Dr	Santa Fe Railroad to ext Sandra Ct	Central	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	Prospect St	Pioneer Ave to North Grand Ave	Central	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	Prospect St, ext	ext Heritage Ave to ex. 12" n/o HWY 190	Central	12	1,700	42	71,400		71,400	82,110	94,000
Pipe	Jaye St, ext	ext Brown Ave to Gibbons	Central	12	2,640	42	110,880		110,880	127,512	147,000

Table 6.1 Capital Improvement Program
City of Porterville Water System Master Plan

Type of Improv.	Street	Limits	Pressure Zone	Pipeline and Appurtenances Costs				Other Infrastr. Costs (\$)	Baseline Constr. Cost (\$)	Estimated Constr. Cost ² (\$)	Capital Improv. Cost ³ (\$)
				Diameter (in)	Length (ft)	Unit Cost (\$)	Pipe Cost (\$)				
Pipe	Indiana St.	Scranton Ave to Gibbons Ave.	Central	16	1,320	56	73,920		73,920	85,008	98,000
Pipe	Scranton Ave	Newcomb St to Indiana St	Airport/Central	12	5,280	42	221,760		221,760	255,024	293,000
Casing	Scranton Ave	Cross Highway 65	Airport/Central	12/24	300	336	100,800		100,800	115,920	133,000
Pipe	Scranton Ave	Connect Airport Pipe to Westwood St	Airport/Central	12	1,750	42	73,500		73,500	84,525	97,000
Pipe	Scranton Ave	Westwood St. to Newcomb St	Airport/Central	12	5,280	42	221,760		221,760	255,024	293,000
Pipe	Road 224	Scranton Ave and n/o Tea Pot Dome Ave	Airport/Central	12	5,280	42	221,760		221,760	255,024	293,000
Pipe	Newcomb St	Scranton Ave to Tea Pot Dome	Airport/Central	12	5,280	42	221,760		221,760	255,024	293,000
Pipe	Tea Pot Dome Av.	Road 224 to Newcomb St.	Airport/Central	12	7,000	42	294,000		294,000	338,100	389,000
Pipe	Henderson Ave	ext. Road 222 to ext. Road 224	West	12	1,320	42	55,440		55,440	63,756	73,000
Pipe	Morton Ave.	Westwood St. to ext. Road 224	West	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	ext. Road 224	Morton Ave. to Henderson Ave.	West	12	2,640	42	110,880		110,880	127,512	147,000
7,007,000											
Expansion Improvements (2010 - 2015)											
Generator		Location to be determined by City	n/a					50,000	50,000	57,500	66,000
Well	No. 37	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Well	No. 38	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Well	No. 39	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Well	No. 40	Location to be determined by City	n/a					375,000	375,000	431,250	496,000
Tank	North Tank	0.25 MG (HGL = 680 feet)	North					250,000	250,000	287,500	331,000
Pump Stat ¹	North Tank PS	n/o Linda Vista (2 x 500 gpm)	North					110,000	110,000	126,500	145,000
Pipe	North Zone	n/o Linda Vista to North Tank	North	12	5,280	42	221,760		221,760	255,024	293,000
Casing	Linda Vista ext.	crossing Railroad	North	12/24	150	336	50,400		50,400	57,960	67,000
PRV	Henderson Ave	east of Hillcrest St	East-Rocky Hill 2	12				15,000	15,000	17,250	20,000
PRV	Hillcrest St.	North of Henderson Ave	East-Rocky Hill 3	12				15,000	15,000	17,250	20,000
Tank	Rocky Hill 3 Tank	0.25 MG (HGL = 825 feet)	Rocky Hill 3					300,000	300,000	345,000	397,000
Pump Stat ¹	Rocky Hill 3 PS	Hillcrest n/o Henderson Ave (2 x 500 gpm)	Rocky Hill 3					110,000	110,000	126,500	145,000
Pipe	Hillcrest St.	Henderson Ave to Rocky Hill 3 Tank	Rocky Hill 3	12	6,600	42	277,200		277,200	318,780	367,000
Pipe	Plano St	Westfield Ave to La Vida	East	12	1,900	42	79,800		79,800	91,770	106,000
Pipe	Conner St	Roby Ave to Springville Ave	East	12	2,500	42	105,000		105,000	120,750	139,000
Pipe	Conner St.	Hwy 190 to Springville	East	12	1,400	42	58,800		58,800	67,620	78,000
Pipe	La Vida Ave, ext	Lime St to Plano St	Central	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	La Vida Ave, ext	Santa Fe Railroad to Lime St	Central	12	1,320	42	55,440		55,440	63,756	73,000
PRV	La Vida Ave, ext	W. from Plano St	Central-East	12				15,000	15,000	17,250	20,000

Table 6.1 Capital Improvement Program
City of Porterville Water System Master Plan

Type of Improv.	Street	Limits	Pressure Zone	Pipeline and Appurtenances Costs				Other Infrastr. Costs (\$)	Baseline Constr. Cost (\$)	Estimated Constr. Cost ² (\$)	Capital Improv. Cost ³ (\$)
				Diameter (in)	Length (ft)	Unit Cost (\$)	Pipe Cost (\$)				
Pipe	Plano St	Worth Ave to Gibbons Ave	Central	12	1,320	42	55,440		55,440	63,756	73,000
Pipe	Main St	North Grand Ave to Linda Vista Ave	Central	12	2,600	42	109,200		109,200	125,580	144,000
Pipe	Lime St	Reid St to Sandra Ct	Central	12	5,280	42	221,760		221,760	255,024	293,000
Pipe	Indiana St	Scranton Ave to s/o. Crawford Ave	Central	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	Ruth St, ext	St Highway 190 to Worth Ave	Central	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	Worth Ave	Santa Fe Railroad to Road 265	Central	12	3,500	42	147,000		147,000	169,050	194,000
Pipe	Road 265	Worth Ave. to Hwy 190	Central	12	2,640	42	110,880		110,880	127,512	147,000
Pipe	St Highway 190	ext Ruth St to Road 265	Central	12	3,200	42	134,400		134,400	154,560	178,000
Pipe	Newcomb St	Highway 190 to Scranton Ave	Central	12	6,000	42	252,000		252,000	289,800	333,000
PRV	Worth Ave	East on Worth Ave from Ruth St	Central-East	12				15,000	15,000	17,250	20,000
PRV	St Highway 190	E. from Ruth St	Central-East	12				15,000	15,000	17,250	20,000
Pipe	Heritage Ave, ext	Mathew St. to Newcomb St.	West	12	1,640	42	68,880		68,880	79,212	91,000
PRV	Heritage Ave	West on Heritage Ave from Newcomb	West-Central	12				15,000	15,000	17,250	20,000
Pump Stat ¹	Martin Hill 2	near Martin Hill Tank (2 x 500 gpm) Fire Cap.	Martin Hill					110,000	110,000	126,500	145,000
Pipe	Martin Hill 2	Miscellaneous Zone piping	Martin Hill	12	1,500	42	63,000		63,000	72,450	83,000
6,433,000											

Notes:

1. Pump Station cost estimated using Pump Station Design by Robert L. Shanks.
2. Baseline Construction costs plus 15% to account for unforeseen events and unknown conditions.
3. Estimated Construction Cost plus 15% to cover other costs including; engineering, administration, construction inspection, and legal costs. (Rounded to the nearest thousand)
4. Proposed casings size and carrier pipe size.

connection fees be reviewed and adjusted, if necessary, to reflect the cost difference between the 1989 Master Plan estimates and the actual construction cost of projects constructed since the previous master plan.

Adjusted Cost of 1990-1995 Capital Improvements

The period starting August 7, 1990 and ending August 6, 1995 was selected as the five-year review period for tracking the estimated capital costs of the 1989 Master Plan and comparing them with the actual project costs. The review period start date (August 7, 1990) coincides with the date the Council adopted a resolution to implement the 1989 Master Plan fees.

The 1989 Master Plan projects that were constructed within the five-year review period have been identified by City staff and are summarized in Table 6.2. Whenever the actual constructed projects differed from the 1989 Master Plan project, adjustments were made to provide an equitable comparison of costs. The adjustments were accomplished after a review of the project "as-built" drawings and following discussions with City staff.

As Table 6.2 shows, some actual constructed projects extended beyond the 1989 Master Plan projects while others constituted a portion of the master plan project. The costs of the 1989 master plan were thus adjusted proportionally.

The 1989 Master Plan projects costs reflect the 20-cities ENR index of 4646. The adjusted Master Plan projects, equating to the actual constructed projects, were escalated up from ENR 4646 to the construction midpoint of the constructed projects, using the same 20-cities ENR index. The ENR index of each project is also listed in Table 6.2.

A comparison of costs between the escalated Master Plan projects and the constructed projects was then performed and the differences recorded in the last two columns of Table 6.2. The second to last column represents the difference, in dollar amount, while the last column represents an equivalent percentage difference from the 1989 Master Plan cost. A negative difference value indicates that the actual project was constructed more efficiently than anticipated, while a positive difference indicates that the project cost more than anticipated.

Some more specific considerations in determining the cost comparisons are as follows:

- If the constructed project corresponded directly to a specific segment between two or more nodes in the 1989 Master Plan, the latter cost estimates (after ENR escalation) and the actual construction costs were compared directly irrespective if the two lengths differed slightly.
- The master plan estimate and the actual construction costs were also compared directly if the constructed project accomplished the intent of the 1989 Master Plan between any two nodes (i.e. the constructed project may have deviated from the

**Table 6.2 Updated Costs of 1990-1995 Capital Improvements
City of Porterville Water System Master Plan**

Water Project No.	Project Name	89MP Pipe No.	Project Bld Date	Council Acceptance Date	Project ENR Date 1	Project ENR	89MP Pipe Length	89MP Pipe Cost Estimate	89MP Estimate of Pipe Constructed in Total Project	ENR Update of 89MP Estimate of Pipe Constructed	Actual Length of Pipe Constructed in Total Project	Cost of Total Project	Portion of 89MP Pipe Constructed in Total Project 2	Cost of 89MP Pipe Constructed in Total Project	Differential Between Actual Cost and 89MP Cost	
							(ft)	(\$)	(\$)	(\$)	(ft)	(\$)	(ft)	(\$)	(\$)	(%)
1	Sierra Vista	308	Apr-90	Feb-91	Aug-91	4850	2,640	97,680	11,100	11,587	300	9,814	300	9,814	1,773	-18%
2	Enterprise Zone	333	Sep-90	1/91 & 4/91	Dec-90	4770	2,640	97,680	76,400	78,439	3,995	206,800	2,065	106,894	-28,455	27%
3	Linda Vista Project	298 299 300 301 302 387	Jul-90	Apr-91	Nov-90	4760	2,640 2,640 1,320 1,320 2,640 2,300 12,860	97,680 97,680 48,840 48,840 97,680 85,100 475,820	408,480	418,503	11,040	462,600	11,040	462,600	-44,097	10%
4	Union Avenue/Indiana	335 336	Dec-90	May-91	Feb-90	4700	1,320 1,990 3,310	48,840 73,630 122,470	122,470	123,893	3,596	116,000	2,928	94,480	29,413	-31%
5	Highway 190	248 314 315 317 348	Jul-90	Jul-91	Dec-90	4769	1,320 1,990 660 2,640 672 7,282	48,840 91,540 30,360 97,680 24,860 293,280	293,280	301,044	7,582	469,300	all	469,300	-168,256	36%
6	E. Olive Avenue	296	Mar-91	Dec-91	Aug-91	4850	2,640	97,680	63,400	66,184	4,843	111,330	1,714	39,400	26,784	-68%
7	Well No. 23		Jun-91	Mar-92	Dec-91	4889		360,000	360,000	378,829		220,750		220,750	158,079	-72%
8	River View Subdivision	309	Dec-91	Jul-92	Mar-92	4931	2,640	97,680	29,190	30,981	789	12,850	789	12,850	18,131	-141%
9	Porter Creek	306	Sep-92	Mar-93	Nov-92	5044	2,640	97,680	97,680	106,048	2,544	47,178	all	47,178	58,870	-125%
10	Westwood Estates	274	Feb-93	Jun-93	Mar-93	5160	1,320	48,840	46,619	51,777	1,988	62,126	1,260	39,375	12,402	-31%
11	Olive Avenue/Westwood	279 308 349	Mar-93	Jul-93	May-93	5226	1,320 2,640 2,640 6,600	48,840 97,680 97,680 244,200	137,700	154,890	1,356 1,060 1,305 3,722	116,300	1,356 1,060 1,305 3,722	116,300	38,590	-33%
12	Jasmine Ranch P.S.		Jan-92	Apr-94	Feb-93	5080		50,000	50,000	54,671		71,485		71,485	-16,814	24%
13	Well No. 24		Apr-92	Sep-94	Aug-93	5277		300,000	300,000	340,745		286,400		286,400	54,345	-19%
14	North Pointe	212 303	Feb-94	Oct-94	Jun-94	5500	1,320 1,320 2,640	40,920 48,840 89,760	89,760	106,259	2,733	56,022	all	56,022	50,237	-90%
TOTALS									\$2,086,000	\$2,224,000				\$2,033,000	\$191,000	-9%

Notes:

1. Assumed it took one month from job closing to council acceptance and the ENR date was mid point of the construction period.
2. "All" assumed the total pipe constructed met the MP objectives of the pipe shown between the MP nodes in column 8 even though it may have taken a different route or was not the same length.
3. Master Plan ENR - October 1989-
4. Linda Vista - A portion of this project shown in the MP was not constructed.
5. Union Ave./Indiana - All shown in MP was constructed plus some not in MP. Portion not in MP was deleted.
6. E. Olive Ave. - The portion not in MP was deleted.
7. Riverview Subdivision - Only a portion of MP constructed.
9. Westwood Estates - There was a portion on Henderson Avenue which was not in MP and not all MP pipe on Westwood Street was constructed.
10. Olive Ave./Westwood - Portions in MP not constructed.

master plan route or a pump station and force main was substituted for a gravity pipeline).

- If only a portion of a project between any two nodes was constructed, the master plan estimate was reduced by the ratio of the actual constructed pipe length to the estimated master plan length of pipeline between nodes.
- If the project extended beyond the master plan project, the constructed cost was reduced by the ratio of the actual length of pipeline constructed (taken from as-built drawing) to the total length of the constructed pipeline.
- When a pipeline was constructed where a master plan pipe was shown on the master plan drawing but was inadvertently left out of the 1989 cost estimate, this segment was considered not in the master plan as its cost was not a part of the 1989 fee determination.
- Where a pipeline in the master plan was shown to extend the total distance between two nodes but the distance given was inadvertently shown as only a part of the distance between nodes, the constructed cost of the whole distance was still compared to the cost estimate shown for the pipeline between these two nodes as this was the cost estimate used in the fee determination to accomplish that project.

Recommended Connection Fees

There were twelve water projects with two water wells that were approved by City staff and Council during the five-year period starting August 7, 1990 and ending August 6, 1995 as shown on Table 6.2. The difference in cost shows a saving of \$191,000 (9%) compared to the 1989 Water Master Plan estimates.

The Capital Improvement Program costs estimated for the period ending in year 2015 constitute approximately \$20,000,000. The connection fee analysis presented in Table 6.3 included applying an adjustment (credit), as discussed in the previous section, as well as considering the current balance in the Water Replacement Fund. Following discussions with City staff, and based on the assumptions presented in this section, it was determined that the Water Connection Fees do not need to be changed at this time.

Table 6.3 Revised Water Connection Fees
City of Porterville Water System Master Plan

Land Use	Expansion Area			Base Alternative			Proposed Revisions to Fees			
	2000-2015 ¹		Adjusted Area ³ (acres)	1999/2000 Fees ⁴ (\$/acre)	Collected CIP Fees		Proposed		Collected CIP Fees	
	Area (acres)	% of Total (%)			Amount ⁶ (\$)	% of Total (%)	Fees ⁵ (\$/acre)	% Increase ⁸ (%)	Amount ⁷ (\$)	% of Total (%)
R-Hillside ²	1,400	23%	1,260	2,130	2,982,000	15%	1,000	0%	1,260,000	8%
R-1	2,200	37%	1,980	2,130	4,686,000	24%	2,130	0%	4,217,400	26%
R-2	50	1%	45	5,332	266,600	1%	5,332	0%	239,940	1%
R-3 \$ R-4	70	1%	63	12,448	871,360	4%	12,448	0%	784,224	5%
Institutional	1,200	20%	1,080	1,389	1,666,800	8%	1,389	0%	1,500,120	9%
Commercial	360	6%	324	1,600	576,000	3%	1,600	0%	518,400	3%
Industrial	720	12%	648	12,294	8,851,680	44%	12,294	0%	7,966,512	48%
Total	6,000	100%	5,400		19,900,000	100%			16,487,000	100%
				<u>Adjustments to reflect 1990-1995 CIP Costs Update</u>						
				2000-2015 CIP Costs (Table 6.1) ⁹						
				20,280,000						
				1990-1995 CIP Update/Credit (Table 6.2) ¹⁰						
				-191,000						
				Balance in Water Replacement Fund (January 2001)						
				-3,400,000						
				2000-2015 CIP Fees (needed to be collected) ¹¹						
				16,689,000						
Notes:										
1 Expansion Improvements within the UDB, through the planning horizon year of 2015										
2 The Hillside Residential Zone, as defined by City Planning, allows up to 1 dwelling unit per 3 acres.										
3 Areas adjusted to 90% of gross acreages, to account for potentially undevelopable acreages within the expansion zone.										
4 Connection Fees, effective July 1, 2000										
5 Proposed adjustment to Connection Fees to cover the cost of future Improvements.										
6 Projected CIP fees collected based on the 1999/2000 Connection Fees, in dollars.										
7 Projected CIP fees collected based on the proposed adjusted Connection Fees, in dollars										
8 Proposed adjustment to Connection Fees, in percent.										
9 Estimated CIP costs for expansions between 2000-2015 (see Table 6.1), in dollars.										
10 Adjustment to CIP costs, based on update of 1989 master plan costs (see Table 6.2), in dollars.										
11 CIP that needs to be collected for the expansion improvements, less the credit based on the 1990-1995 CIP update analysis, less the balance in the Water Replacement Fund.										

Last Revised: February 2001

SCENIC HEIGHTS SPECIFIC AREA, WATER STORAGE REQUIREMENTS

1. Water Demand Details

Domestic Max Demand = 2.1 x Average Day Demand
Peak Hour Demand = 3.4 x Average Day Demand

2. Water Quantity Details

2.1 Day Flow

Source of Supply to Potable Reservoir Day = 1,500 gpm
Peak Hour diverted by Storage

2.2 Storm Quantity Available From

Excess Capacity Available at PRR
Supply to PRR on Scenic Heights 2 MG tank

3. Water Storage Details

3.1 Day Flow

Operational Storage 25% of Maximum Day Demand
Peak Storage 1,500 gpm for 2 hours
Emergency Storage
NCEQ Emergency Water Storage

3.2 Storm Storage Specific Area

Operational Storage From Other Zone of 10.2 Scenic Heights
Peak for Peak 40
Fire Storage 1,000 gpm for 2 hours
Emergency Storage 25% of Maximum Day Demand

4. Water Demand - Scenic Heights Specific Area

	DATE	2013	2014
Existing Service Area (Approximate)	A	30	30
Proposed Service Area (Approximate)	B	60	60
	DATE	2013/01/01	2013/01/01
Land Use Coefficient (conservatively)	C	1.200	1.200
Land Density (Residential)	D	1.200	1.200
Average Day Demand (MGD)	E	72,000	72,000
Maximum Day Demand (MGD)	F	151,200	151,200
Peak Hour Demand (MGD)	G	244,800	244,800

Scenic Heights Specific Area Preliminary Water Storage Requirements

Date: April 10, 1998

1. Water Demand Criteria

Maximum Day Demand = 2.2 x Average Day Demand
Peak Hour Demand = 3.4 x Average Day Demand

2. Water Supply Criteria

2.1 City Wide

Source of Supply to Provide Maximum Day + 3,000 gpm
Peak Hour provided by Storage

2.2 Scenic Heights Specific Area

No Source of Supply Available in Area
Supply to Rely on Scenic Heights 3 MG tank

3. Water Storage Criteria

3.1 City Wide

Operational Storage	25 % of Maximum Day Demand
Fire Storage	3,500 gpm for 3 hours
Emergency Storage	Underground. (However, NEED Emergency Power Generators)

3.2 Scenic Heights Specific Area

Operational Storage	From Other Zone (3 MG Scenic Heights). Also, see (note b)
Fire Storage	1,000 gpm for 2 hours
Emergency Storage	50% of Maximum Day Demand

4. Water Demand - Scenic Heights Specific Area

	<u>Code</u>	<u>acres</u>	
Existing Service Area (approximate)	A	50	
Ultimate Service Area (approximate)	B	60	
	<u>Code</u>	<u>gpd/acre</u>	<u>gpm/acre</u>
Land Use Coefficient (preliminary)			
Low Density Residential	C	1,200	0.83
Average Day Demand (B x C)	D	72,000	50
Maximum Day Demand (D * 2.2)	E	158,400	110
Peak Hour Demand (D * 3.4)	F	244,800	170

Scenic Heights Specific Area Preliminary Water Storage Requirements (Cont'd)

5. Water Supply - Scenic Heights Specific Area

Supply from 3 MG Scenic Heights Storage Tank
No Other Source of Supply Available.
Therefore, Emergency Storage is Needed.

6. Water Storage - Scenic Heights Specific Area

	<u>gallons</u>	
Operational Storage		(Note b)
Fire Storage (1,000 gpm * 2 hours)	120,000	
Emergency Storage (0.5 * E)	79,200	
Total Storage Needed	199,200	

7. New Storage Tank Size - Scenic Heights Specific Area

Minimum Storage Tank Size	200,000	(Note a)
Recommended Storage Tank Size	300,000	(Note b)

Notes:

- a) Accounts for 2-hour residential fire plus emergency storage at 50% maximum day
- b) During water system operation, it is likely that the New tank may mistakenly be used for for operation purposes. To account for that possibility, It is recommended that the tank be upsized by one-third (1/3). This additional 1/3 capacity, reserved for operation purposes, can also be used for energy management.

Appendices

HYDRAULIC MODEL INPUT FILE

Node	Flow	Pressure	Time	Velocity	Direction
1	100.00	10.0000	1	1.0	Downstream
2	100.00	10.0000	1	1.0	Downstream
3	100.00	10.0000	1	1.0	Downstream
4	100.00	10.0000	1	1.0	Downstream
5	100.00	10.0000	1	1.0	Downstream
6	100.00	10.0000	1	1.0	Downstream
7	100.00	10.0000	1	1.0	Downstream
8	100.00	10.0000	1	1.0	Downstream
9	100.00	10.0000	1	1.0	Downstream
10	100.00	10.0000	1	1.0	Downstream
11	100.00	10.0000	1	1.0	Downstream
12	100.00	10.0000	1	1.0	Downstream
13	100.00	10.0000	1	1.0	Downstream
14	100.00	10.0000	1	1.0	Downstream
15	100.00	10.0000	1	1.0	Downstream
16	100.00	10.0000	1	1.0	Downstream
17	100.00	10.0000	1	1.0	Downstream
18	100.00	10.0000	1	1.0	Downstream
19	100.00	10.0000	1	1.0	Downstream
20	100.00	10.0000	1	1.0	Downstream
21	100.00	10.0000	1	1.0	Downstream
22	100.00	10.0000	1	1.0	Downstream
23	100.00	10.0000	1	1.0	Downstream
24	100.00	10.0000	1	1.0	Downstream
25	100.00	10.0000	1	1.0	Downstream
26	100.00	10.0000	1	1.0	Downstream
27	100.00	10.0000	1	1.0	Downstream
28	100.00	10.0000	1	1.0	Downstream
29	100.00	10.0000	1	1.0	Downstream
30	100.00	10.0000	1	1.0	Downstream
31	100.00	10.0000	1	1.0	Downstream
32	100.00	10.0000	1	1.0	Downstream
33	100.00	10.0000	1	1.0	Downstream
34	100.00	10.0000	1	1.0	Downstream
35	100.00	10.0000	1	1.0	Downstream
36	100.00	10.0000	1	1.0	Downstream
37	100.00	10.0000	1	1.0	Downstream
38	100.00	10.0000	1	1.0	Downstream
39	100.00	10.0000	1	1.0	Downstream
40	100.00	10.0000	1	1.0	Downstream
41	100.00	10.0000	1	1.0	Downstream
42	100.00	10.0000	1	1.0	Downstream
43	100.00	10.0000	1	1.0	Downstream
44	100.00	10.0000	1	1.0	Downstream
45	100.00	10.0000	1	1.0	Downstream
46	100.00	10.0000	1	1.0	Downstream
47	100.00	10.0000	1	1.0	Downstream
48	100.00	10.0000	1	1.0	Downstream
49	100.00	10.0000	1	1.0	Downstream
50	100.00	10.0000	1	1.0	Downstream
51	100.00	10.0000	1	1.0	Downstream
52	100.00	10.0000	1	1.0	Downstream
53	100.00	10.0000	1	1.0	Downstream
54	100.00	10.0000	1	1.0	Downstream
55	100.00	10.0000	1	1.0	Downstream
56	100.00	10.0000	1	1.0	Downstream
57	100.00	10.0000	1	1.0	Downstream
58	100.00	10.0000	1	1.0	Downstream
59	100.00	10.0000	1	1.0	Downstream
60	100.00	10.0000	1	1.0	Downstream
61	100.00	10.0000	1	1.0	Downstream
62	100.00	10.0000	1	1.0	Downstream
63	100.00	10.0000	1	1.0	Downstream
64	100.00	10.0000	1	1.0	Downstream
65	100.00	10.0000	1	1.0	Downstream
66	100.00	10.0000	1	1.0	Downstream
67	100.00	10.0000	1	1.0	Downstream
68	100.00	10.0000	1	1.0	Downstream
69	100.00	10.0000	1	1.0	Downstream
70	100.00	10.0000	1	1.0	Downstream
71	100.00	10.0000	1	1.0	Downstream
72	100.00	10.0000	1	1.0	Downstream
73	100.00	10.0000	1	1.0	Downstream
74	100.00	10.0000	1	1.0	Downstream
75	100.00	10.0000	1	1.0	Downstream
76	100.00	10.0000	1	1.0	Downstream
77	100.00	10.0000	1	1.0	Downstream
78	100.00	10.0000	1	1.0	Downstream
79	100.00	10.0000	1	1.0	Downstream
80	100.00	10.0000	1	1.0	Downstream
81	100.00	10.0000	1	1.0	Downstream
82	100.00	10.0000	1	1.0	Downstream
83	100.00	10.0000	1	1.0	Downstream
84	100.00	10.0000	1	1.0	Downstream
85	100.00	10.0000	1	1.0	Downstream
86	100.00	10.0000	1	1.0	Downstream
87	100.00	10.0000	1	1.0	Downstream
88	100.00	10.0000	1	1.0	Downstream
89	100.00	10.0000	1	1.0	Downstream
90	100.00	10.0000	1	1.0	Downstream
91	100.00	10.0000	1	1.0	Downstream
92	100.00	10.0000	1	1.0	Downstream
93	100.00	10.0000	1	1.0	Downstream
94	100.00	10.0000	1	1.0	Downstream
95	100.00	10.0000	1	1.0	Downstream
96	100.00	10.0000	1	1.0	Downstream
97	100.00	10.0000	1	1.0	Downstream
98	100.00	10.0000	1	1.0	Downstream
99	100.00	10.0000	1	1.0	Downstream
100	100.00	10.0000	1	1.0	Downstream

[TITLE]
City of Porterville
Water Distribution System Master Plan
; Last Updated: March 1999
; Project Engineer: Tony Akel

[JUNCTIONS]

;;ID	Elev	Demand	Pttrn	Zone	Description
2	435.00	0.00000	1	;;1	Junction
4	430.00	0.00000	1	;;1	Junction
6	430.00	0.00000	1	;;1	Junction
8	430.00	2.10000	1	;;1	Junction
10	425.00	0.00000	1	;;1	Junction
12	425.00	22.30000	1	;;1	Junction
14	450.00	0.00000	1	;;1	Junction
16	420.00	44.10000	1	;;1	Junction
18	415.00	42.00000	1	;;1	Junction
20	415.00	23.80000	1	;;1	Junction
22	411.00	22.30000	1	;;1	Junction
24	416.00	0.00000	1	;;1	Junction
26	416.00	0.00000	1	;;1	Junction
28	416.00	0.00000	1	;;1	Junction
30	417.00	0.00000	1	;;1	Junction
32	418.00	63.50000	1	;;1	Junction
34	418.00	0.00000	1	;;1	Junction
36	419.00	0.00000	1	;;1	Junction
38	420.00	0.00000	1	;;1	Junction
40	418.00	0.00000	1	;;1	Junction
42	419.00	0.00000	1	;;1	Junction
44	423.00	165.90000	1	;;1	Junction
46	417.00	0.00000	1	;;1	Junction
50	418.00	0.00000	1	;;1	Junction
52	420.00	50.60000	1	;;1	Junction
54	420.00	0.00000	1	;;1	Junction
56	420.00	0.00000	1	;;1	Junction
58	422.00	0.00000	1	;;1	Junction
60	421.00	0.00000	1	;;1	Junction
62	421.00	0.00000	1	;;1	Junction
64	437.00	0.00000	1	;;1	Junction
66	432.00	0.00000	1	;;1	Junction
68	434.00	0.00000	1	;;1	Junction
70	433.00	0.00000	1	;;1	Junction
72	427.00	70.50000	1	;;1	Junction
74	427.00	0.00000	1	;;1	Junction
76	428.00	0.00000	1	;;1	Junction
78	428.00	0.00000	1	;;1	Junction
80	437.00	0.00000	1	;;1	Junction
82	437.00	0.00000	1	;;1	Junction
84	557.00	0.00000	1	;;1	Junction
86	660.00	22.00000	1	;;1	Junction
88	510.00	0.00000	1	;;4	Junction
90	510.00	0.00000	1	;;4	Junction
92	510.00	0.00000	1	;;4	Junction
94	551.00	15.20000	1	;;4	Junction
96	551.00	25.80000	1	;;4	Junction
98	551.00	20.80000	1	;;4	Junction
100	575.00	0.00000	1	;;4	Junction

100	575.00	0.00000	1	;;4	Junction
102	565.00	0.00000	1	;;1	Junction
104	570.00	0.00000	1	;;1	Junction
106	448.00	45.10000	1	;;1	Junction
108	450.00	0.00000	1	;;1	Junction
110	450.00	0.00000	1	;;1	Junction
112	457.00	0.00000	1	;;1	Junction
116	570.00	0.00000	1	;;1	Junction
118	480.00	0.00000	1	;;1	Junction
120	444.00	0.00000	1	;;1	Junction
122	445.00	0.00000	1	;;1	Junction
124	443.00	0.00000	1	;;1	Junction
128	441.00	0.00000	1	;;1	Junction
130	443.00	0.00000	1	;;1	Junction
132	447.00	0.00000	1	;;1	Junction
134	445.00	0.00000	1	;;1	Junction
136	445.00	0.00000	1	;;1	Junction
138	448.00	99.80000	1	;;1	Junction
140	453.00	0.00000	1	;;1	Junction
142	455.00	0.00000	1	;;1	Junction
164	415.00	0.00000	1	;;1	Junction
166	416.00	0.00000	1	;;1	Junction
168	419.00	55.20000	1	;;1	Junction
170	420.00	0.00000	1	;;1	Junction
172	419.00	0.00000	1	;;1	Junction
174	420.00	0.00000	1	;;1	Junction
176	417.00	0.00000	1	;;1	Junction
178	418.00	0.00000	1	;;1	Junction
180	417.00	0.00000	1	;;1	Junction
182	418.00	0.00000	1	;;1	Junction
184	419.00	0.00000	1	;;1	Junction
186	420.00	0.00000	1	;;1	Junction
188	419.00	0.00000	1	;;1	Junction
190	421.00	61.60000	1	;;1	Junction
192	420.00	0.00000	1	;;1	Junction
194	420.00	0.00000	1	;;1	Junction
196	422.00	0.00000	1	;;1	Junction
198	424.00	0.00000	1	;;1	Junction
200	425.00	48.50000	1	;;1	Junction
202	422.00	0.00000	1	;;1	Junction
204	421.00	0.00000	1	;;1	Junction
206	421.00	0.00000	1	;;1	Junction
208	422.00	0.00000	1	;;1	Junction
210	423.00	0.00000	1	;;1	Junction
212	422.00	0.00000	1	;;1	Junction
214	424.00	0.00000	1	;;1	Junction
216	421.00	0.00000	1	;;1	Junction
226	418.00	0.00000	1	;;1	Junction
228	424.00	0.00000	1	;;1	Junction
230	421.00	0.00000	1	;;1	Junction
232	420.00	0.00000	1	;;1	Junction
234	426.00	87.00000	1	;;1	Junction
236	426.00	63.70000	1	;;1	Junction
238	423.00	98.00000	1	;;1	Junction
240	429.00	0.00000	1	;;1	Junction
242	429.00	85.60000	1	;;1	Junction
244	431.00	0.00000	1	;;1	Junction

246	431.00	49.20000	1	;;1	Junction
248	425.00	0.00000	1	;;1	Junction
250	426.00	0.00000	1	;;1	Junction
252	425.00	0.00000	1	;;1	Junction
254	427.00	0.00000	1	;;1	Junction
256	427.00	0.00000	1	;;1	Junction
258	428.00	0.00000	1	;;1	Junction
260	425.00	0.00000	1	;;1	Junction
262	425.00	0.00000	1	;;1	Junction
264	430.00	91.90000	1	;;1	Junction
266	430.00	83.80000	1	;;1	Junction
268	433.00	0.00000	1	;;1	Junction
270	432.00	0.00000	1	;;1	Junction
272	433.00	0.00000	1	;;1	Junction
274	444.00	0.00000	1	;;1	Junction
276	442.00	0.00000	1	;;1	Junction
278	443.00	0.00000	1	;;1	Junction
280	442.00	0.00000	1	;;1	Junction
282	437.00	0.00000	1	;;1	Junction
284	437.00	74.10000	1	;;1	Junction
286	438.00	0.00000	1	;;1	Junction
288	438.00	0.00000	1	;;1	Junction
290	435.00	0.00000	1	;;1	Junction
292	435.00	0.00000	1	;;1	Junction
294	435.00	0.00000	1	;;1	Junction
296	435.00	0.00000	1	;;1	Junction
298	435.00	0.00000	1	;;1	Junction
300	435.00	0.00000	1	;;1	Junction
302	437.00	0.00000	1	;;1	Junction
304	437.00	0.00000	1	;;1	Junction
306	437.00	0.00000	1	;;1	Junction
308	439.00	0.00000	1	;;1	Junction
310	440.00	0.00000	1	;;1	Junction
312	440.00	63.40000	1	;;1	Junction
314	439.00	61.90000	1	;;1	Junction
316	445.00	0.00000	1	;;1	Junction
318	444.00	0.00000	1	;;1	Junction
320	449.00	38.50000	1	;;1	Junction
322	449.00	0.00000	1	;;1	Junction
324	448.00	0.00000	1	;;1	Junction
326	459.00	0.00000	1	;;1	Junction
328	458.00	0.00000	1	;;1	Junction
332	447.00	0.00000	1	;;1	Junction
338	447.00	0.00000	1	;;1	Junction
340	447.00	15.70000	1	;;1	Junction
346	447.00	3.00000	1	;;1	Junction
348	447.00	0.00000	1	;;1	Junction
352	445.00	0.00000	1	;;1	Junction
356	446.00	0.00000	1	;;1	Junction
358	446.00	0.00000	1	;;1	Junction
360	445.00	0.00000	1	;;1	Junction
362	445.00	0.00000	1	;;1	Junction
364	444.00	0.00000	1	;;1	Junction
396	419.00	0.00000	1	;;1	Junction
398	420.00	0.00000	1	;;1	Junction
400	420.00	0.00000	1	;;1	Junction
436	421.00	0.00000	1	;;1	Junction

614	430.00	0.00000	1	;;1	Junction
618	420.00	0.00000	1	;;1	Junction
620	422.00	0.00000	1	;;1	Junction
622	423.00	0.00000	1	;;1	Junction
624	423.00	0.00000	1	;;1	Junction
626	426.00	0.00000	1	;;1	Junction
628	419.00	43.50000	1	;;1	Junction
630	424.00	0.00000	1	;;1	Junction
632	424.00	0.00000	1	;;1	Junction
634	427.00	41.30000	1	;;1	Junction
636	420.00	0.00000	1	;;1	Junction
638	427.00	0.00000	1	;;1	Junction
640	428.00	0.00000	1	;;1	Junction
642	427.00	0.00000	1	;;1	Junction
644	431.00	117.30000	1	;;1	Junction
646	433.00	0.00000	1	;;1	Junction
648	433.00	0.00000	1	;;1	Junction
650	434.00	0.00000	1	;;1	Junction
652	435.00	71.40000	1	;;1	Junction
654	436.00	0.00000	1	;;1	Junction
656	432.00	94.70000	1	;;1	Junction
658	432.00	0.00000	1	;;1	Junction
660	433.00	0.00000	1	;;1	Junction
662	434.00	0.00000	1	;;1	Junction
664	434.00	0.00000	1	;;1	Junction
666	434.00	0.00000	1	;;1	Junction
668	433.00	0.00000	1	;;1	Junction
670	434.00	0.00000	1	;;1	Junction
672	434.00	0.00000	1	;;1	Junction
674	435.00	0.00000	1	;;1	Junction
676	435.00	0.00000	1	;;1	Junction
678	435.00	0.00000	1	;;1	Junction
680	435.00	103.40000	1	;;1	Junction
682	432.00	88.30000	1	;;1	Junction
684	429.00	0.00000	1	;;1	Junction
686	430.00	0.00000	1	;;1	Junction
688	430.00	0.00000	1	;;1	Junction
690	432.00	0.00000	1	;;1	Junction
692	430.00	70.40000	1	;;1	Junction
694	428.00	0.00000	1	;;1	Junction
696	428.00	49.30000	1	;;1	Junction
698	427.00	0.00000	1	;;1	Junction
700	428.00	0.00000	1	;;1	Junction
702	427.00	0.00000	1	;;1	Junction
704	428.00	57.20000	1	;;1	Junction
706	428.00	0.00000	1	;;1	Junction
708	428.00	0.00000	1	;;1	Junction
710	428.00	0.00000	1	;;1	Junction
712	428.00	0.00000	1	;;1	Junction
714	429.00	0.00000	1	;;1	Junction
716	432.00	0.00000	1	;;1	Junction
718	437.00	0.00000	1	;;1	Junction
720	438.00	0.00000	1	;;1	Junction
722	428.00	0.00000	1	;;1	Junction
724	428.00	0.00000	1	;;1	Junction
726	429.00	0.00000	1	;;1	Junction
730	435.00	0.00000	1	;;1	Junction

732	437.00	38.30000	1	;;1	Junction
734	438.00	0.00000	1	;;1	Junction
736	438.00	0.00000	1	;;1	Junction
738	439.00	0.00000	1	;;1	Junction
740	439.00	0.00000	1	;;1	Junction
742	436.00	0.00000	1	;;1	Junction
744	436.00	0.00000	1	;;1	Junction
746	436.00	0.00000	1	;;1	Junction
748	440.00	64.10000	1	;;1	Junction
750	439.00	0.00000	1	;;1	Junction
752	440.00	0.00000	1	;;1	Junction
754	440.00	89.30000	1	;;1	Junction
756	442.00	0.00000	1	;;1	Junction
758	440.00	0.00000	1	;;1	Junction
760	442.00	0.00000	1	;;1	Junction
762	439.00	41.70000	1	;;1	Junction
764	438.00	0.00000	1	;;1	Junction
766	437.00	0.00000	1	;;1	Junction
768	437.00	0.00000	1	;;1	Junction
770	444.00	0.00000	1	;;1	Junction
772	438.00	0.00000	1	;;1	Junction
774	438.00	0.00000	1	;;1	Junction
776	436.00	0.00000	1	;;1	Junction
778	435.00	0.00000	1	;;1	Junction
780	435.00	0.00000	1	;;1	Junction
782	437.00	0.00000	1	;;1	Junction
784	442.00	0.00000	1	;;1	Junction
786	439.00	0.00000	1	;;1	Junction
788	443.00	0.00000	1	;;1	Junction
790	444.00	0.00000	1	;;1	Junction
792	445.00	0.00000	1	;;1	Junction
794	447.00	163.60000	1	;;1	Junction
796	448.00	0.00000	1	;;1	Junction
798	449.00	0.00000	1	;;1	Junction
800	446.00	0.00000	1	;;1	Junction
802	445.00	75.00000	1	;;1	Junction
804	445.00	0.00000	1	;;1	Junction
806	449.00	0.00000	1	;;1	Junction
808	447.00	0.00000	1	;;1	Junction
810	447.00	0.00000	1	;;1	Junction
812	449.00	0.00000	1	;;1	Junction
814	450.00	0.00000	1	;;1	Junction
816	452.00	0.00000	1	;;1	Junction
818	451.00	0.00000	1	;;1	Junction
820	453.00	0.00000	1	;;1	Junction
822	446.00	0.00000	1	;;1	Junction
824	437.00	0.00000	1	;;1	Junction
826	441.00	119.60000	1	;;1	Junction
828	440.00	0.00000	1	;;1	Junction
830	438.00	0.00000	1	;;1	Junction
832	430.00	0.00000	1	;;1	Junction
834	430.00	0.00000	1	;;1	Junction
836	430.00	0.00000	1	;;1	Junction
838	431.00	0.00000	1	;;1	Junction
840	435.00	17.60000	1	;;1	Junction
842	440.00	72.60000	1	;;1	Junction
844	441.00	87.60000	1	;;1	Junction

846	443.00	0.00000	1	;;1	Junction
848	444.00	55.30000	1	;;1	Junction
850	444.00	0.00000	1	;;1	Junction
852	442.00	0.00000	1	;;1	Junction
854	444.00	0.00000	1	;;1	Junction
856	443.00	48.40000	1	;;1	Junction
858	445.00	0.00000	1	;;1	Junction
860	447.00	79.00000	1	;;1	Junction
862	445.00	0.00000	1	;;1	Junction
864	447.00	0.00000	1	;;1	Junction
866	447.00	0.00000	1	;;1	Junction
868	448.00	11.90000	1	;;1	Junction
870	439.00	43.40000	1	;;1	Junction
872	440.00	0.00000	1	;;1	Junction
874	447.00	0.00000	1	;;1	Junction
876	449.00	0.00000	1	;;1	Junction
878	448.00	38.30000	1	;;1	Junction
880	447.00	0.00000	1	;;1	Junction
884	446.00	0.00000	1	;;1	Junction
886	450.00	0.00000	1	;;1	Junction
888	452.00	67.20000	1	;;1	Junction
890	452.00	0.00000	1	;;1	Junction
892	452.00	79.70000	1	;;1	Junction
894	453.00	0.00000	1	;;1	Junction
896	452.00	0.00000	1	;;1	Junction
898	454.00	0.00000	1	;;1	Junction
900	455.00	0.00000	1	;;1	Junction
902	455.00	0.00000	1	;;1	Junction
904	455.00	33.70000	1	;;1	Junction
906	455.00	76.80000	1	;;1	Junction
908	456.00	0.00000	1	;;1	Junction
910	458.00	0.00000	1	;;1	Junction
912	457.00	0.00000	1	;;1	Junction
914	459.00	0.00000	1	;;1	Junction
916	448.00	0.00000	1	;;1	Junction
918	448.00	117.40000	1	;;1	Junction
920	449.00	0.00000	1	;;1	Junction
922	450.00	0.00000	1	;;1	Junction
924	451.00	0.00000	1	;;1	Junction
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928	452.00	0.00000	1	;;1	Junction
930	451.00	0.00000	1	;;1	Junction
932	450.00	0.00000	1	;;1	Junction
934	449.00	0.00000	1	;;1	Junction
936	450.00	0.00000	1	;;1	Junction
938	449.00	0.00000	1	;;1	Junction
940	448.00	0.00000	1	;;1	Junction
942	448.00	0.00000	1	;;1	Junction
944	449.00	111.00000	1	;;1	Junction
946	450.00	0.00000	1	;;1	Junction
948	451.00	0.00000	1	;;1	Junction
950	452.00	0.00000	1	;;1	Junction
952	452.00	0.00000	1	;;1	Junction
958	452.00	0.00000	1	;;1	Junction
960	452.00	0.00000	1	;;1	Junction
962	454.00	0.00000	1	;;1	Junction
964	454.00	0.00000	1	;;1	Junction

966	453.00	61.50000	1	;;1	Junction
968	453.00	0.00000	1	;;1	Junction
970	452.00	0.00000	1	;;1	Junction
972	453.00	0.00000	1	;;1	Junction
974	455.00	0.00000	1	;;1	Junction
976	452.00	101.30000	1	;;1	Junction
978	450.00	0.00000	1	;;1	Junction
980	449.00	0.00000	1	;;1	Junction
982	448.00	0.00000	1	;;1	Junction
984	447.00	0.00000	1	;;1	Junction
986	445.00	0.00000	1	;;1	Junction
990	444.00	0.00000	1	;;1	Junction
992	446.00	0.00000	1	;;1	Junction
994	445.00	0.00000	1	;;1	Junction
996	445.00	85.30000	1	;;1	Junction
998	444.00	85.10000	1	;;1	Junction
2000	447.00	0.00000	1	;;1	Junction
2002	447.00	0.00000	1	;;1	Junction
2004	445.00	0.00000	1	;;1	Junction
2006	442.00	0.00000	1	;;1	Junction
2008	442.00	0.00000	1	;;1	Junction
2010	451.00	0.00000	1	;;1	Junction
2012	450.00	0.00000	1	;;1	Junction
2014	454.00	0.00000	1	;;1	Junction
2018	454.00	0.00000	1	;;1	Junction
2020	454.00	0.00000	1	;;1	Junction
2024	445.00	0.00000	1	;;1	Junction
2026	445.00	0.00000	1	;;1	Junction
2030	449.00	0.00000	1	;;1	Junction
2032	450.00	0.00000	1	;;1	Junction
2034	450.00	56.80000	1	;;1	Junction
2038	448.00	0.00000	1	;;1	Junction
2040	448.00	0.00000	1	;;1	Junction
2042	457.00	0.00000	1	;;1	Junction
2044	455.00	144.60000	1	;;1	Junction
2046	456.00	0.00000	1	;;1	Junction
2048	456.00	0.00000	1	;;1	Junction
2050	458.00	0.00000	1	;;1	Junction
2052	459.00	0.00000	1	;;1	Junction
2054	455.00	57.20000	1	;;1	Junction
2056	463.00	0.00000	1	;;1	Junction
2058	472.00	0.00000	1	;;1	Junction
2060	468.00	0.00000	1	;;1	Junction
2062	466.00	129.50000	1	;;1	Junction
2064	450.00	0.00000	1	;;1	Junction
2078	483.00	0.00000	1	;;1	Junction
2080	438.00	0.00000	1	;;1	Junction
2132	481.00	0.00000	1	;;1	Junction
2134	483.00	0.00000	1	;;1	Junction
2150	471.00	0.00000	1	;;1	Junction
2152	470.00	0.00000	1	;;1	Junction
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2188	467.00	8.00000	1	;;1	Junction
2190	466.00	29.10000	1	;;1	Junction
2192	464.00	60.30000	1	;;1	Junction
2194	470.00	0.00000	1	;;1	Junction
2196	469.00	0.00000	1	;;1	Junction

2198	463.00	45.10000	1	;;1	Junction
2200	459.00	67.70000	1	;;1	Junction
2202	458.00	0.00000	1	;;1	Junction
2204	457.00	0.00000	1	;;1	Junction
2206	460.00	0.00000	1	;;1	Junction
2208	460.00	97.80000	1	;;1	Junction
2210	460.00	0.00000	1	;;1	Junction
2212	463.00	1.00000	1	;;1	Junction
2214	474.00	28.00000	1	;;1	Junction
2216	473.00	0.00000	1	;;1	Junction
2218	475.00	19.00000	1	;;1	Junction
2220	477.00	0.00000	1	;;1	Junction
2222	480.00	0.00000	1	;;1	Junction
2224	461.00	0.00000	1	;;1	Junction
2226	464.00	0.00000	1	;;1	Junction
2228	468.00	0.00000	1	;;1	Junction
2230	466.00	0.00000	1	;;1	Junction
2232	463.00	0.00000	1	;;1	Junction
2234	463.00	0.00000	1	;;1	Junction
2240	459.00	0.00000	1	;;1	Junction
2242	452.00	98.50000	1	;;1	Junction
2244	455.00	0.00000	1	;;1	Junction
2246	457.00	121.80000	1	;;1	Junction
2248	455.00	0.00000	1	;;1	Junction
2250	465.00	0.00000	1	;;1	Junction
2252	467.00	0.00000	1	;;1	Junction
2254	475.00	0.00000	1	;;1	Junction
2256	482.00	0.00000	1	;;1	Junction
2258	464.00	0.00000	1	;;1	Junction
2260	463.00	0.00000	1	;;1	Junction
2262	462.00	63.20000	1	;;1	Junction
2264	460.00	0.00000	1	;;1	Junction
2266	459.00	0.00000	1	;;1	Junction
2268	460.00	0.00000	1	;;1	Junction
2270	460.00	0.00000	1	;;1	Junction
2272	462.00	0.00000	1	;;1	Junction
2274	464.00	0.00000	1	;;1	Junction
2276	466.00	0.00000	1	;;1	Junction
2278	461.00	0.00000	1	;;1	Junction
2280	460.00	0.00000	1	;;1	Junction
2282	459.00	0.00000	1	;;1	Junction
2284	459.00	0.00000	1	;;1	Junction
2286	456.00	0.00000	1	;;1	Junction
2288	467.00	0.00000	1	;;1	Junction
2290	463.00	0.00000	1	;;1	Junction
2292	458.00	0.00000	1	;;1	Junction
2294	459.00	0.00000	1	;;1	Junction
2296	458.00	70.00000	1	;;1	Junction
2298	457.00	0.00000	1	;;1	Junction
2300	457.00	0.00000	1	;;1	Junction
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2304	455.00	0.00000	1	;;1	Junction
2306	455.00	42.20000	1	;;1	Junction
2308	455.00	0.00000	1	;;1	Junction
2310	456.00	0.00000	1	;;1	Junction
2316	457.00	0.00000	1	;;1	Junction
2320	457.00	0.00000	1	;;1	Junction

2322	455.00	0.00000	1	;;1	Junction
2324	454.00	0.00000	1	;;1	Junction
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2332	455.00	0.00000	1	;;1	Junction
2334	455.00	0.00000	1	;;1	Junction
2336	454.00	0.00000	1	;;1	Junction
2186	485.00	0.00000	1	;;3	Junction
2184	505.00	0.00000	1	;;3	Junction
2182	497.00	0.00000	1	;;3	Junction
2180	510.00	0.00000	1	;;3	Junction
2178	510.00	0.00000	1	;;3	Junction
2176	505.00	0.00000	1	;;3	Junction
2174	500.00	66.00000	1	;;3	Junction
2172	515.00	0.00000	1	;;3	Junction
2170	490.00	9.90000	1	;;3	Junction
2168	485.00	14.30000	1	;;3	Junction
2166	488.00	0.00000	1	;;3	Junction
2160	478.00	0.00000	1	;;3	Junction
2158	476.00	0.00000	1	;;3	Junction
2156	475.00	0.00000	1	;;3	Junction
2148	600.00	72.60000	1	;;3	Junction
2146	540.00	0.00000	1	;;3	Junction
2144	540.00	0.00000	1	;;3	Junction
2142	540.00	0.00000	1	;;3	Junction
2140	540.00	0.00000	1	;;3	Junction
2138	505.00	0.00000	1	;;3	Junction
2136	493.00	0.00000	1	;;3	Junction
2130	485.00	34.00000	1	;;3	Junction
2128	490.00	0.00000	1	;;3	Junction
2126	492.00	0.00000	1	;;3	Junction
2124	510.00	15.20000	1	;;3	Junction
2122	514.00	0.00000	1	;;3	Junction
2120	486.00	0.00000	1	;;3	Junction
2118	490.00	0.00000	1	;;3	Junction
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2112	485.00	0.00000	1	;;3	Junction
2106	490.00	0.00000	1	;;3	Junction
2104	535.00	0.00000	1	;;3	Junction
2102	510.00	0.00000	1	;;3	Junction
2100	525.00	0.00000	1	;;3	Junction
2098	525.00	0.00000	1	;;3	Junction
2096	509.00	0.00000	1	;;3	Junction
2094	499.00	0.00000	1	;;3	Junction
2092	500.00	0.00000	1	;;3	Junction
2090	498.00	0.00000	1	;;3	Junction
2088	504.00	0.00000	1	;;3	Junction
2086	507.00	0.00000	1	;;3	Junction
2084	497.00	0.00000	1	;;3	Junction
2082	500.00	56.40000	1	;;3	Junction
2164	476.00	0.00000	1	;;3	Junction
2162	475.00	0.00000	1	;;3	Junction
2110	483.00	0.00000	1	;;3	Junction
2108	488.00	0.00000	1	;;3	Junction
2076	494.00	0.00000	1	;;3	Junction
2074	497.00	6.90000	1	;;3	Junction
2072	498.00	0.00000	1	;;3	Junction

2070	495.00	0.00000	1	;;3	Junction
2068	502.00	0.00000	1	;;3	Junction
2066	486.00	51.10000	1	;;3	Junction
378	527.00	0.00000	1	;;3	Junction
376	513.00	0.00000	1	;;3	Junction
370	511.00	37.40000	1	;;3	Junction
368	500.00	0.00000	1	;;3	Junction
366	500.00	84.60000	1	;;3	Junction
374	572.00	0.00000	1	;;3	Junction
380	558.00	11.40000	1	;;3	Junction
146	470.00	0.00000	1	;;3	Junction
144	451.00	75.80000	1	;;3	Junction
344	452.00	0.00000	1	;;3	Junction
342	447.00	0.00000	1	;;3	Junction
616	426.00	0.00000	1	;;2	Junction
612	422.00	0.00000	1	;;2	Junction
610	420.00	0.00000	1	;;2	Junction
608	420.00	0.00000	1	;;2	Junction
606	421.00	0.00000	1	;;2	Junction
604	420.00	61.60000	1	;;2	Junction
602	422.00	0.00000	1	;;2	Junction
600	422.00	0.00000	1	;;2	Junction
598	421.00	0.00000	1	;;2	Junction
594	420.00	0.00000	1	;;2	Junction
592	419.00	0.00000	1	;;2	Junction
590	417.00	0.00000	1	;;2	Junction
588	416.00	0.00000	1	;;2	Junction
586	416.00	104.70000	1	;;2	Junction
584	418.00	0.00000	1	;;2	Junction
582	418.00	74.40000	1	;;2	Junction
580	417.00	0.00000	1	;;2	Junction
578	416.00	0.00000	1	;;2	Junction
576	415.00	0.00000	1	;;2	Junction
574	414.00	0.00000	1	;;2	Junction
572	415.00	0.00000	1	;;2	Junction
570	413.00	0.00000	1	;;2	Junction
568	411.00	0.00000	1	;;2	Junction
566	415.00	0.00000	1	;;2	Junction
564	414.00	0.00000	1	;;2	Junction
562	411.00	0.00000	1	;;2	Junction
560	411.00	0.00000	1	;;2	Junction
558	414.00	0.00000	1	;;2	Junction
556	415.00	55.00000	1	;;2	Junction
554	415.00	0.00000	1	;;2	Junction
552	417.00	0.00000	1	;;2	Junction
550	415.00	118.50000	1	;;2	Junction
548	417.00	0.00000	1	;;2	Junction
546	419.00	0.00000	1	;;2	Junction
544	421.00	0.00000	1	;;2	Junction
542	419.00	0.00000	1	;;2	Junction
540	422.00	0.00000	1	;;2	Junction
538	420.00	0.00000	1	;;2	Junction
536	422.00	0.00000	1	;;2	Junction
534	422.00	105.70000	1	;;2	Junction
532	425.00	0.00000	1	;;2	Junction
530	426.00	105.30000	1	;;2	Junction
528	427.00	0.00000	1	;;2	Junction

526	426.00	0.00000	1	::2	Junction
524	422.00	0.00000	1	::2	Junction
520	423.00	0.00000	1	::2	Junction
518	423.00	0.00000	1	::2	Junction
516	423.00	0.00000	1	::2	Junction
514	425.00	0.00000	1	::2	Junction
512	428.00	46.30000	1	::2	Junction
510	426.00	0.00000	1	::2	Junction
488	428.00	0.00000	1	::2	Junction
482	428.00	0.00000	1	::2	Junction
478	427.00	60.50000	1	::2	Junction
476	427.00	0.00000	1	::2	Junction
474	426.00	0.00000	1	::2	Junction
472	425.00	0.00000	1	::2	Junction
470	425.00	0.00000	1	::2	Junction
468	423.00	40.70000	1	::2	Junction
466	424.00	0.00000	1	::2	Junction
464	425.00	0.00000	1	::2	Junction
462	425.00	0.00000	1	::2	Junction
460	424.00	0.00000	1	::2	Junction
452	424.00	0.00000	1	::2	Junction
450	422.00	0.00000	1	::2	Junction
448	422.00	0.00000	1	::2	Junction
446	420.00	0.00000	1	::2	Junction
444	417.00	0.00000	1	::2	Junction
440	421.00	50.60000	1	::2	Junction
434	415.00	0.00000	1	::2	Junction
432	416.00	0.00000	1	::2	Junction
430	416.00	0.00000	1	::2	Junction
428	417.00	0.00000	1	::2	Junction
426	418.00	61.80000	1	::2	Junction
424	419.00	0.00000	1	::2	Junction
422	419.00	0.00000	1	::2	Junction
420	417.00	0.00000	1	::2	Junction
418	418.00	0.00000	1	::2	Junction
416	417.00	0.00000	1	::2	Junction
414	418.00	0.00000	1	::2	Junction
406	414.00	0.00000	1	::2	Junction
404	414.00	0.00000	1	::2	Junction
402	414.00	55.00000	1	::2	Junction
728	430.00	0.00000	1	::2	Junction
480	428.00	0.00000	1	::2	Junction
498	429.00	0.00000	1	::2	Junction
494	429.00	73.70000	1	::2	Junction
484	428.00	0.00000	1	::2	Junction
486	431.00	0.00000	1	::2	Junction
490	429.00	0.00000	1	::2	Junction
496	432.00	0.00000	1	::2	Junction
492	430.00	0.00000	1	::2	Junction
500	435.00	0.00000	1	::2	Junction
502	435.00	14.60000	1	::2	Junction
504	435.00	0.00000	1	::2	Junction
508	436.00	0.00000	1	::2	Junction
506	436.00	0.00000	1	::2	Junction
442	414.00	0.00000	1	::2	Junction
412	417.00	0.00000	1	::2	Junction
410	418.00	0.00000	1	::2	Junction

408	414.00	0.00000	1	;;2	Junction
392	414.00	41.80000	1	;;2	Junction
390	418.00	53.90000	1	;;2	Junction
388	416.00	0.00000	1	;;2	Junction
386	418.00	0.00000	1	;;2	Junction
384	418.00	0.00000	1	;;2	Junction
382	416.00	0.00000	1	;;2	Junction
222	415.00	0.00000	1	;;2	Junction
220	415.00	29.70000	1	;;2	Junction
158	413.00	0.00000	1	;;2	Junction
438	421.00	0.00000	1	;;2	Junction
150	412.00	0.00000	1	;;2	Junction
224	418.00	0.00000	1	;;2	Junction
156	411.00	0.00000	1	;;2	Junction
154	410.00	0.00000	1	;;2	Junction
152	411.00	56.70000	1	;;2	Junction
148	411.00	0.00000	1	;;2	Junction
218	418.00	0.00000	1	;;2	Junction
160	414.00	58.30000	1	;;2	Junction
162	415.00	0.00000	1	;;2	Junction
2338	416.00	0.00000	1	;;1	Junction
2340	417.00	0.00000	1	;;1	Junction
2342	418.00	0.00000	1	;;1	Junction
2344	418.00	0.00000	1	;;1	Junction
2346	418.00	0.00000	1	;;1	Junction
2348	418.00	0.00000	1	;;1	Junction
2350	420.00	0.00000	1	;;1	Junction
2352	432.00	0.00000	1	;;1	Junction
2354	431.00	0.00000	1	;;1	Junction
2356	431.00	0.00000	1	;;1	Junction
2358	431.00	0.00000	1	;;1	Junction
2360	430.00	0.00000	1	;;1	Junction
2362	430.00	0.00000	1	;;1	Junction
2364	430.00	0.00000	1	;;1	Junction
2366	435.00	0.00000	1	;;1	Junction
2368	436.00	0.00000	1	;;1	Junction
2370	436.00	0.00000	1	;;1	Junction
2372	438.00	0.00000	1	;;1	Junction
2374	439.00	0.00000	1	;;1	Junction
2376	438.00	93.30000	1	;;1	Junction
2378	438.00	0.00000	1	;;1	Junction
2380	440.00	0.00000	1	;;1	Junction
2382	439.00	0.00000	1	;;1	Junction
2384	438.00	0.00000	1	;;1	Junction
2386	438.00	70.60000	1	;;1	Junction
2388	444.00	0.00000	1	;;1	Junction
2390	443.00	0.00000	1	;;1	Junction
2392	443.00	0.00000	1	;;1	Junction
2394	441.00	0.00000	1	;;1	Junction
2396	439.00	0.00000	1	;;1	Junction
2398	440.00	0.00000	1	;;1	Junction
2400	441.00	0.00000	1	;;1	Junction
2402	442.00	51.70000	1	;;1	Junction
2404	446.00	0.00000	1	;;1	Junction
2406	443.00	0.00000	1	;;1	Junction
2408	442.00	0.00000	1	;;1	Junction
2410	442.00	0.00000	1	;;1	Junction

2412	443.00	0.00000	1	::1	Junction
2414	444.00	2.90000	1	::1	Junction
2416	445.00	1.20000	1	::1	Junction
2418	447.00	0.00000	1	::1	Junction
2420	446.00	0.00000	1	::1	Junction
2422	446.00	0.00000	1	::1	Junction
2424	441.00	0.00000	1	::1	Junction
2426	467.00	117.20000	1	::1	Junction
2428	471.00	0.00000	1	::1	Junction
2430	477.00	17.80000	1	::1	Junction
2432	463.00	0.00000	1	::1	Junction
2434	454.00	48.10000	1	::1	Junction
2436	465.00	0.00000	1	::1	Junction
2438	458.00	0.00000	1	::1	Junction
2440	460.00	0.00000	1	::1	Junction
2442	458.00	76.80000	1	::1	Junction
2444	456.00	0.00000	1	::1	Junction
2446	463.00	0.00000	1	::1	Junction
2448	467.00	58.80000	1	::1	Junction
2450	463.00	0.00000	1	::1	Junction
2452	460.00	60.80000	1	::1	Junction
2454	463.00	0.00000	1	::1	Junction
2456	461.00	0.00000	1	::1	Junction
2458	464.00	0.00000	1	::1	Junction
2460	465.00	0.00000	1	::1	Junction
2462	470.00	0.00000	1	::1	Junction
2464	470.00	0.00000	1	::1	Junction
2466	467.00	49.20000	1	::1	Junction
2468	471.00	0.00000	1	::1	Junction
2470	474.00	26.80000	1	::1	Junction
2472	475.00	0.00000	1	::1	Junction
2474	470.00	0.00000	1	::1	Junction
2476	466.00	0.00000	1	::1	Junction
2478	468.00	0.00000	1	::1	Junction
2480	470.00	95.80000	1	::1	Junction
2482	463.00	0.00000	1	::1	Junction
2484	416.00	0.00000	1	::1	Junction
2486	416.00	0.00000	1	::1	Junction
2488	416.00	14.30000	1	::1	Junction
2490	416.00	0.00000	1	::1	Junction

[TANKS]

::ID	Elev	InitLvl	MinLvl	MaxLvl	Diam	MinVol	Zone
	Description						
1000	661.00	20.00	15.00	30.00	20.00	4712.00	::ZONE 4 50K Scenic Heights Tank
1002	572.00	25.00	15.00	32.00	128.00	200000.00	::ZONE 1 3MG Scenic Heights Tank
1004	191.00	::ZONE 1		Well No. C-18			
1006	246.00	::ZONE 1		Well No. C-16			
1008	275.00	::ZONE 1		Well No. C-10			
1028	212.00	::ZONE 1		Well No. C-20			
1030	284.00	::ZONE 1		Well No. C-17			
1032	269.00	::ZONE 1		Well No. C-15			
1034	269.00	::ZONE 1		Well No. C-25			
1036	305.00	::ZONE 1		Well No. C-7			
1038	256.00	::ZONE 1		Well No. C-23			

1040	247.00	::ZONE 1	Well No. C-19			
1044	402.00	::ZONE 1	Well No. C-4			
1046	262.00	::ZONE 1	Well No. C-3			
1048	360.00	::ZONE 1	Well No. C-1			
1052	277.00	::ZONE 1	Well No. C-11			
1012	612.00	25.00 15.00 32.00 128.00		200000.00	::ZONE 3	3MG East
Porterville Tank						
1026	361.00	::ZONE 2	Well No. R-7			
1024	256.00	::ZONE 2	Well No. C-24			
1018	380.00	::ZONE 2	Well No. L-2			
1016	380.00	::ZONE 2	Well No. L-1			
1014	376.00	::ZONE 2	Well No. L-7			
1056	295.00	::ZONE 1	Well No. C-22			
1058	369.00	::ZONE 2	Well No. L-5			

[PIPES]

:::ID	UpNode	DnNode	Length	Diam	Rough	MnrLoss	ChkVlv
	Description						
1207	958 950	582.09	14.00	120.000000	0.00	:::Pipe	
1805	2402 2404	723.65	12.00	120.000000	0.00	:::Pipe	
1	2 4	640.40	12.00	148.000000	0.00	:::Pipe	
3	4 6	179.68	12.00	148.000000	0.00	:::Pipe	
5	6 8	111.77	12.00	148.000000	0.00	:::Pipe	
7	8 10	1389.11	12.00	148.000000	0.00	:::Pipe	
9	10 12	752.64	12.00	148.000000	0.00	:::Pipe	
11	12 14	1214.39	12.00	148.000000	0.00	:::Pipe	
13	12 16	1416.42	12.00	148.000000	0.00	:::Pipe	
15	16 18	1318.43	12.00	148.000000	0.00	:::Pipe	
17	18 20	1327.91	12.00	148.000000	0.00	:::Pipe	
19	20 22	1522.41	12.00	148.000000	0.00	:::Pipe	
21	20 24	1292.72	12.00	148.000000	0.00	:::Pipe	
23	24 26	502.88	12.00	148.000000	0.00	:::Pipe	
25	26 28	275.38	12.00	148.000000	0.00	:::Pipe	
27	28 30	530.84	12.00	148.000000	0.00	:::Pipe	
153	148 150	1655.24	12.00	148.000000	0.00	:::Pipe	
155	150 152	1295.15	8.00	148.000000	0.00	:::Pipe	
157	152 154	1311.89	8.00	148.000000	0.00	:::Pipe	
159	154 148	1239.91	8.00	148.000000	0.00	:::Pipe	
161	150 158	968.67	12.00	148.000000	0.00	:::Pipe	
231	162 160	886.67	10.00	148.000000	0.00	:::Pipe	
233	218 160	2564.02	12.00	148.000000	0.00	:::Pipe	
259	240 242	39.68	16.00	148.000000	0.00	:::Pipe	
263	244 242	1541.09	16.00	148.000000	0.00	:::Pipe	
333	286 282	869.21	16.00	148.000000	0.00	:::Pipe	
335	282 272	1340.72	16.00	148.000000	0.00	:::Pipe	
343	272 244	1062.56	16.00	148.000000	0.00	:::Pipe	
363	286 128	1294.83	16.00	148.000000	0.00	:::Pipe	
369	128 318	738.12	16.00	148.000000	0.00	:::Pipe	
371	318 316	272.79	16.00	148.000000	0.00	:::Pipe	
393	340 332	122.37	16.00	148.000000	0.00	:::Pipe	
395	332 338	68.27	16.00	148.000000	0.00	:::Pipe	
403	332 348	69.99	16.00	148.000000	0.00	:::Pipe	
409	316 138	603.99	16.00	148.000000	0.00	:::Pipe	
415	138 356	473.98	16.00	148.000000	0.00	:::Pipe	
421	356 352	340.18	16.00	148.000000	0.00	:::Pipe	
429	352 340	1811.04	16.00	148.000000	0.00	:::Pipe	
431	346 366	2511.09	16.00	148.000000	0.00	:::Pipe	

433	366	368	233.12	16.00	148.000000	0.00	;;Pipe
435	368	370	1276.71	16.00	148.000000	0.00	;;Pipe
437	370	376	126.54	16.00	148.000000	0.00	;;Pipe
439	376	378	336.26	16.00	148.000000	0.00	;;Pipe
441	378	374	1013.74	16.00	148.000000	0.00	;;Pipe
443	1012	378	349.98	16.00	148.000000	0.00	;;Pipe
445	374	380	1216.91	16.00	148.000000	0.00	;;Pipe
471	402	404	189.11	8.00	148.000000	0.00	;;Pipe
473	404	406	223.82	8.00	148.000000	0.00	;;Pipe
475	392	408	330.37	12.00	148.000000	0.00	;;Pipe
477	408	402	648.43	12.00	148.000000	0.00	;;Pipe
513	434	402	524.55	12.00	148.000000	0.00	;;Pipe
517	400	436	285.86	12.00	148.000000	0.00	;;Pipe
523	392	442	675.93	12.00	148.000000	0.00	;;Pipe
525	158	442	474.42	12.00	148.000000	0.00	;;Pipe
679	550	554	323.31	12.00	148.000000	0.00	;;Pipe
703	434	554	1463.34	12.00	148.000000	0.00	;;Pipe
709	576	578	720.09	12.00	148.000000	0.00	;;Pipe
711	582	584	171.73	8.00	148.000000	0.00	;;Pipe
713	576	550	943.19	12.00	148.000000	0.00	;;Pipe
715	584	578	611.51	12.00	148.000000	0.00	;;Pipe
717	576	586	1041.33	10.00	148.000000	0.00	;;Pipe
719	586	588	321.25	10.00	148.000000	0.00	;;Pipe
721	590	586	745.64	8.00	148.000000	0.00	;;Pipe
725	582	592	537.07	8.00	148.000000	0.00	;;Pipe
727	592	594	300.53	8.00	148.000000	0.00	;;Pipe
743	610	608	343.46	12.00	148.000000	0.00	;;Pipe
773	628	226	395.11	12.00	148.000000	0.00	;;Pipe
775	628	636	209.42	12.00	148.000000	0.00	;;Pipe
777	636	216	793.11	12.00	148.000000	0.00	;;Pipe
811	656	660	1342.90	8.00	148.000000	0.00	;;Pipe
865	614	696	778.02	12.00	148.000000	0.00	;;Pipe
867	696	694	329.46	12.00	148.000000	0.00	;;Pipe
869	694	698	329.55	12.00	148.000000	0.00	;;Pipe
871	698	704	1061.31	12.00	148.000000	0.00	;;Pipe
873	704	714	292.29	12.00	148.000000	0.00	;;Pipe
875	614	682	1327.75	12.00	148.000000	0.00	;;Pipe
877	682	668	502.84	12.00	148.000000	0.00	;;Pipe
879	668	678	652.02	12.00	148.000000	0.00	;;Pipe
881	678	680	126.28	12.00	148.000000	0.00	;;Pipe
887	584	600	1324.55	12.00	148.000000	0.00	;;Pipe
889	722	724	677.53	14.00	148.000000	0.00	;;Pipe
891	724	726	640.92	14.00	148.000000	0.00	;;Pipe
893	640	722	113.61	14.00	148.000000	0.00	;;Pipe
895	2364	614	1305.71	14.00	148.000000	0.00	;;Pipe
1041	826	748	1334.91	12.00	148.000000	0.00	;;Pipe
1049	840	838	2289.69	12.00	148.000000	0.00	;;Pipe
1051	838	836	1021.88	12.00	148.000000	0.00	;;Pipe
1053	836	834	387.56	12.00	148.000000	0.00	;;Pipe
1055	834	832	642.66	12.00	148.000000	0.00	;;Pipe
1057	832	714	367.55	12.00	148.000000	0.00	;;Pipe
1061	842	844	1944.31	12.00	148.000000	0.00	;;Pipe
1063	844	846	710.58	12.00	148.000000	0.00	;;Pipe
1067	846	854	346.54	12.00	148.000000	0.00	;;Pipe
1069	854	848	313.56	12.00	148.000000	0.00	;;Pipe
1095	872	870	947.46	8.00	148.000000	0.00	;;Pipe
1097	870	868	2680.83	8.00	148.000000	0.00	;;Pipe

1099	860	874	664.34	12.00	148.000000	0.00	::Pipe
1101	874	868	1345.34	12.00	148.000000	0.00	::Pipe
1103	876	878	454.99	10.00	148.000000	0.00	::Pipe
1105	878	880	308.99	10.00	148.000000	0.00	::Pipe
1107	880	2418	470.18	10.00	148.000000	0.00	::Pipe
1111	876	868	1395.58	12.00	148.000000	0.00	::Pipe
1113	868	890	1733.90	10.00	148.000000	0.00	::Pipe
1115	890	892	378.97	10.00	148.000000	0.00	::Pipe
1117	892	894	873.32	10.00	148.000000	0.00	::Pipe
1119	894	896	321.70	10.00	148.000000	0.00	::Pipe
1121	896	888	230.68	10.00	148.000000	0.00	::Pipe
1123	888	886	859.78	12.00	148.000000	0.00	::Pipe
1125	886	876	582.86	12.00	148.000000	0.00	::Pipe
1127	904	902	1372.68	12.00	148.000000	0.00	::Pipe
1129	902	900	276.99	12.00	148.000000	0.00	::Pipe
1131	900	898	256.90	12.00	148.000000	0.00	::Pipe
1133	898	892	701.14	12.00	148.000000	0.00	::Pipe
1135	912	2438	586.37	12.00	148.000000	0.00	::Pipe
1137	910	908	623.82	12.00	148.000000	0.00	::Pipe
1139	908	906	322.25	12.00	148.000000	0.00	::Pipe
1141	906	900	430.52	12.00	148.000000	0.00	::Pipe
1143	914	908	1732.42	8.00	148.000000	0.00	::Pipe
1357	2056	2054	1316.16	10.00	148.000000	0.00	::Pipe
1359	2060	2056	425.74	10.00	148.000000	0.00	::Pipe
1367	2068	2066	1311.86	12.00	148.000000	0.00	::Pipe
1369	2066	2058	661.31	10.00	148.000000	0.00	::Pipe
1371	2070	2068	551.77	8.00	148.000000	0.00	::Pipe
1377	2072	2068	763.78	12.00	148.000000	0.00	::Pipe
1381	2080	870	1335.64	12.00	148.000000	0.00	::Pipe
1407	2100	2102	560.92	12.00	148.000000	0.00	::Pipe
1409	2100	2104	805.39	12.00	148.000000	0.00	::Pipe
1411	2104	380	1300.01	16.00	148.000000	0.00	::Pipe
1413	2106	2102	1323.58	12.00	148.000000	0.00	::Pipe
1415	2106	2120	905.95	12.00	148.000000	0.00	::Pipe
1417	2120	2118	407.52	12.00	148.000000	0.00	::Pipe
1419	2118	2116	444.22	12.00	148.000000	0.00	::Pipe
1425	2116	2126	155.58	12.00	148.000000	0.00	::Pipe
1427	2126	2128	498.20	12.00	148.000000	0.00	::Pipe
1429	2128	2130	461.76	12.00	148.000000	0.00	::Pipe
1431	2130	2112	253.73	12.00	148.000000	0.00	::Pipe
1433	2112	2110	516.64	10.00	148.000000	0.00	::Pipe
1435	2110	2108	660.50	12.00	148.000000	0.00	::Pipe
1437	2108	2076	513.89	12.00	148.000000	0.00	::Pipe
1439	2114	2108	498.20	6.00	148.000000	0.00	::Pipe
1441	2114	2112	678.59	6.00	148.000000	0.00	::Pipe
1445	2136	2106	1317.07	12.00	148.000000	0.00	::Pipe
1447	2148	2146	1168.65	10.00	148.000000	0.00	::Pipe
1449	2140	2138	1429.44	12.00	148.000000	0.00	::Pipe
1451	2138	2136	1325.30	12.00	148.000000	0.00	::Pipe
1453	2140	2142	73.03	12.00	148.000000	0.00	::Pipe
1455	2142	2144	80.94	12.00	148.000000	0.00	::Pipe
1457	2160	2158	697.72	12.00	148.000000	0.00	::Pipe
1459	2158	2156	307.61	12.00	148.000000	0.00	::Pipe
1461	2156	2150	1920.36	12.00	148.000000	0.00	::Pipe
1463	2160	2106	1291.81	12.00	148.000000	0.00	::Pipe
1465	2150	2162	588.11	12.00	148.000000	0.00	::Pipe
1467	2162	2164	188.93	12.00	148.000000	0.00	::Pipe

1469	2164	2110	1018.06	12.00	148.000000	0.00	;;Pipe
1473	2166	2170	389.02	8.00	148.000000	0.00	;;Pipe
1475	2166	2168	560.99	8.00	148.000000	0.00	;;Pipe
1477	2160	2186	1337.92	8.00	148.000000	0.00	;;Pipe
1479	2186	2166	1330.68	8.00	148.000000	0.00	;;Pipe
1481	2166	2182	1345.17	8.00	148.000000	0.00	;;Pipe
1483	2182	2184	1323.00	8.00	148.000000	0.00	;;Pipe
1485	2184	2180	182.07	8.00	148.000000	0.00	;;Pipe
1487	2180	2172	797.18	8.00	148.000000	0.00	;;Pipe
1489	2172	2174	1266.59	8.00	148.000000	0.00	;;Pipe
1491	2174	2176	326.22	8.00	148.000000	0.00	;;Pipe
1493	2176	2178	434.79	8.00	148.000000	0.00	;;Pipe
1557	2228	2230	262.52	8.00	148.000000	0.00	;;Pipe
1559	2230	2220	869.64	8.00	148.000000	0.00	;;Pipe
1565	2216	2250	688.67	8.00	148.000000	0.00	;;Pipe
1569	2250	2224	426.42	8.00	148.000000	0.00	;;Pipe
1571	2230	2232	435.17	8.00	148.000000	0.00	;;Pipe
1645	2232	2294	1431.11	8.00	148.000000	0.00	;;Pipe
1647	2224	2296	1450.26	8.00	148.000000	0.00	;;Pipe
1699	2308	2018	293.78	8.00	148.000000	0.00	;;Pipe
1739	726	2364	456.97	14.00	148.000000	0.00	;;Pipe
1839	2438	910	229.29	12.00	148.000000	0.00	;;Pipe
29	28	46	845.07	6.00	120.000000	0.00	;;Pipe
31	46	32	537.03	6.00	120.000000	0.00	;;Pipe
33	30	32	844.36	12.00	120.000000	0.00	;;Pipe
35	32	40	446.62	12.00	120.000000	0.00	;;Pipe
37	40	42	654.73	12.00	120.000000	0.00	;;Pipe
43	32	34	483.13	6.00	120.000000	0.00	;;Pipe
45	34	36	483.73	6.00	120.000000	0.00	;;Pipe
47	36	38	827.65	6.00	120.000000	0.00	;;Pipe
49	30	50	1330.37	12.00	120.000000	0.00	;;Pipe
51	50	52	749.36	6.00	120.000000	0.00	;;Pipe
53	52	38	550.20	6.00	120.000000	0.00	;;Pipe
55	42	54	458.69	12.00	120.000000	0.00	;;Pipe
57	54	44	177.21	12.00	120.000000	0.00	;;Pipe
59	38	60	450.70	6.00	120.000000	0.00	;;Pipe
61	60	56	277.77	6.00	120.000000	0.00	;;Pipe
63	56	58	619.72	6.00	120.000000	0.00	;;Pipe
65	58	54	1006.37	6.00	120.000000	0.00	;;Pipe
67	44	62	855.76	8.00	120.000000	0.00	;;Pipe
69	44	64	299.48	12.00	120.000000	0.00	;;Pipe
71	12	66	868.58	12.00	120.000000	0.00	;;Pipe
73	66	68	1777.54	12.00	120.000000	0.00	;;Pipe
75	68	70	314.35	12.00	120.000000	0.00	;;Pipe
77	70	72	478.14	10.00	120.000000	0.00	;;Pipe
79	68	74	1282.37	12.00	120.000000	0.00	;;Pipe
81	74	76	815.13	6.00	120.000000	0.00	;;Pipe
83	72	76	1282.27	6.00	120.000000	0.00	;;Pipe
85	72	78	348.13	10.00	120.000000	0.00	;;Pipe
87	78	80	1233.04	10.00	120.000000	0.00	;;Pipe
89	80	82	405.01	6.00	120.000000	0.00	;;Pipe
91	86	84	1276.67	6.00	120.000000	0.00	;;Pipe
93	84	88	464.50	6.00	120.000000	0.00	;;Pipe
95	88	90	236.44	8.00	120.000000	0.00	;;Pipe
97	90	92	619.21	8.00	120.000000	0.00	;;Pipe
99	84	94	713.87	6.00	120.000000	0.00	;;Pipe
101	94	96	100.29	6.00	120.000000	0.00	;;Pipe

103	96	98	91.07	6.00	120.000000	0.00	::Pipe
105	98	100	538.84	6.00	120.000000	0.00	::Pipe
109	104	106	705.26	10.00	120.000000	0.00	::Pipe
111	106	108	628.43	10.00	120.000000	0.00	::Pipe
121	102	118	488.39	12.00	120.000000	0.00	::Pipe
123	118	122	526.51	12.00	120.000000	0.00	::Pipe
127	124	120	561.68	12.00	120.000000	0.00	::Pipe
131	130	128	536.70	12.00	120.000000	0.00	::Pipe
133	106	132	558.16	6.00	120.000000	0.00	::Pipe
135	132	134	362.89	6.00	120.000000	0.00	::Pipe
137	134	136	680.48	6.00	120.000000	0.00	::Pipe
139	108	138	1308.86	8.00	120.000000	0.00	::Pipe
141	116	104	131.26	10.00	120.000000	0.00	::Pipe
143	108	140	448.71	10.00	120.000000	0.00	::Pipe
145	140	142	259.60	8.00	120.000000	0.00	::Pipe
149	144	146	1264.62	8.00	120.000000	0.00	::Pipe
151	156	148	441.38	8.00	120.000000	0.00	::Pipe
163	184	186	489.52	6.00	120.000000	0.00	::Pipe
165	186	174	332.91	6.00	120.000000	0.00	::Pipe
167	174	172	721.31	6.00	120.000000	0.00	::Pipe
169	174	176	811.56	6.00	120.000000	0.00	::Pipe
171	176	178	222.13	6.00	120.000000	0.00	::Pipe
173	178	182	268.18	6.00	120.000000	0.00	::Pipe
175	182	184	314.17	6.00	120.000000	0.00	::Pipe
177	178	180	231.09	6.00	120.000000	0.00	::Pipe
179	180	50	414.70	8.00	120.000000	0.00	::Pipe
181	50	188	575.89	8.00	120.000000	0.00	::Pipe
183	188	184	110.97	6.00	120.000000	0.00	::Pipe
185	188	190	748.19	8.00	120.000000	0.00	::Pipe
187	190	194	638.15	6.00	120.000000	0.00	::Pipe
189	194	192	277.58	6.00	120.000000	0.00	::Pipe
191	192	170	240.61	6.00	120.000000	0.00	::Pipe
193	172	170	249.38	6.00	120.000000	0.00	::Pipe
195	170	168	323.66	6.00	120.000000	0.00	::Pipe
197	168	166	1146.69	8.00	120.000000	0.00	::Pipe
199	166	164	286.32	8.00	120.000000	0.00	::Pipe
201	190	200	1283.83	8.00	120.000000	0.00	::Pipe
203	200	198	675.07	12.00	120.000000	0.00	::Pipe
205	198	196	795.50	12.00	120.000000	0.00	::Pipe
207	198	210	258.78	6.00	120.000000	0.00	::Pipe
209	210	208	508.61	6.00	120.000000	0.00	::Pipe
211	208	206	480.28	6.00	120.000000	0.00	::Pipe
213	206	204	259.59	6.00	120.000000	0.00	::Pipe
215	204	192	526.46	6.00	120.000000	0.00	::Pipe
217	204	202	268.18	6.00	120.000000	0.00	::Pipe
219	202	194	517.31	6.00	120.000000	0.00	::Pipe
221	168	196	1311.57	6.00	120.000000	0.00	::Pipe
223	202	212	379.15	6.00	120.000000	0.00	::Pipe
225	212	214	489.60	6.00	120.000000	0.00	::Pipe
227	214	210	388.51	6.00	120.000000	0.00	::Pipe
229	196	216	380.06	12.00	120.000000	0.00	::Pipe
235	224	220	1212.28	12.00	120.000000	0.00	::Pipe
237	220	158	721.75	12.00	120.000000	0.00	::Pipe
239	52	232	546.75	6.00	120.000000	0.00	::Pipe
241	232	230	319.46	6.00	120.000000	0.00	::Pipe
243	230	228	767.08	6.00	120.000000	0.00	::Pipe
245	228	190	1127.88	6.00	120.000000	0.00	::Pipe

247	228	236	1528.45	6.00	120.000000	0.00	;;Pipe
249	236	238	1345.05	8.00	120.000000	0.00	;;Pipe
251	238	60	816.85	6.00	120.000000	0.00	;;Pipe
253	236	240	1276.02	8.00	120.000000	0.00	;;Pipe
255	240	234	1832.62	12.00	120.000000	0.00	;;Pipe
257	234	200	839.02	12.00	120.000000	0.00	;;Pipe
261	246	2362	638.07	12.00	120.000000	0.00	;;Pipe
265	238	258	997.89	6.00	120.000000	0.00	;;Pipe
267	258	256	314.15	6.00	120.000000	0.00	;;Pipe
269	256	254	140.75	6.00	120.000000	0.00	;;Pipe
271	254	252	709.39	6.00	120.000000	0.00	;;Pipe
273	252	250	160.07	6.00	120.000000	0.00	;;Pipe
275	250	248	294.00	6.00	120.000000	0.00	;;Pipe
277	248	236	964.87	6.00	120.000000	0.00	;;Pipe
279	264	262	1042.85	12.00	120.000000	0.00	;;Pipe
281	262	260	83.42	12.00	120.000000	0.00	;;Pipe
283	260	74	1341.98	12.00	120.000000	0.00	;;Pipe
285	266	264	1323.09	8.00	120.000000	0.00	;;Pipe
287	266	76	322.84	6.00	120.000000	0.00	;;Pipe
289	260	244	1263.33	12.00	120.000000	0.00	;;Pipe
291	244	246	58.79	12.00	120.000000	0.00	;;Pipe
295	268	264	1301.14	8.00	120.000000	0.00	;;Pipe
297	246	270	507.26	8.00	120.000000	0.00	;;Pipe
299	270	268	570.17	8.00	120.000000	0.00	;;Pipe
301	122	274	363.51	12.00	120.000000	0.00	;;Pipe
303	274	278	234.27	12.00	120.000000	0.00	;;Pipe
305	278	280	97.53	12.00	120.000000	0.00	;;Pipe
307	130	276	78.84	12.00	120.000000	0.00	;;Pipe
309	120	130	279.47	12.00	120.000000	0.00	;;Pipe
311	300	298	714.16	6.00	120.000000	0.00	;;Pipe
313	298	296	175.36	6.00	120.000000	0.00	;;Pipe
315	296	294	238.11	6.00	120.000000	0.00	;;Pipe
317	294	292	203.74	6.00	120.000000	0.00	;;Pipe
319	292	290	308.09	6.00	120.000000	0.00	;;Pipe
321	298	304	630.95	6.00	120.000000	0.00	;;Pipe
323	304	302	255.49	6.00	120.000000	0.00	;;Pipe
325	302	292	638.15	6.00	120.000000	0.00	;;Pipe
327	302	284	316.95	6.00	120.000000	0.00	;;Pipe
329	284	282	63.39	8.00	120.000000	0.00	;;Pipe
331	286	288	56.00	8.00	120.000000	0.00	;;Pipe
337	288	284	876.36	8.00	120.000000	0.00	;;Pipe
339	284	290	665.99	8.00	120.000000	0.00	;;Pipe
341	290	268	652.86	8.00	120.000000	0.00	;;Pipe
345	264	300	664.87	12.00	120.000000	0.00	;;Pipe
347	300	306	277.76	12.00	120.000000	0.00	;;Pipe
349	306	308	648.48	12.00	120.000000	0.00	;;Pipe
351	308	310	618.14	12.00	120.000000	0.00	;;Pipe
353	310	312	339.46	12.00	120.000000	0.00	;;Pipe
355	312	124	610.92	12.00	120.000000	0.00	;;Pipe
357	310	286	1187.51	6.00	120.000000	0.00	;;Pipe
359	312	314	1189.45	6.00	120.000000	0.00	;;Pipe
373	314	286	344.19	6.00	120.000000	0.00	;;Pipe
375	266	320	1591.05	6.00	120.000000	0.00	;;Pipe
377	320	308	1294.09	6.00	120.000000	0.00	;;Pipe
385	100	322	208.25	6.00	120.000000	0.00	;;Pipe
387	142	326	1184.65	8.00	120.000000	0.00	;;Pipe
389	328	144	623.07	8.00	120.000000	0.00	;;Pipe

399	144	342	1258.35	8.00	120.000000	0.00	;;Pipe
401	342	344	162.22	8.00	120.000000	0.00	;;Pipe
413	140	358	1312.86	10.00	120.000000	0.00	;;Pipe
417	142	360	1346.18	6.00	120.000000	0.00	;;Pipe
419	358	360	357.02	10.00	120.000000	0.00	;;Pipe
423	338	364	1245.49	10.00	120.000000	0.00	;;Pipe
425	364	362	314.48	10.00	120.000000	0.00	;;Pipe
427	362	360	304.20	10.00	120.000000	0.00	;;Pipe
447	220	222	456.61	8.00	120.000000	0.00	;;Pipe
449	222	388	686.73	8.00	120.000000	0.00	;;Pipe
451	388	390	657.94	8.00	120.000000	0.00	;;Pipe
453	390	386	251.73	8.00	120.000000	0.00	;;Pipe
455	386	384	96.63	6.00	120.000000	0.00	;;Pipe
457	384	382	779.84	6.00	120.000000	0.00	;;Pipe
459	382	222	380.45	6.00	120.000000	0.00	;;Pipe
461	392	388	715.99	6.00	120.000000	0.00	;;Pipe
463	226	396	492.90	12.00	120.000000	0.00	;;Pipe
465	396	398	586.42	12.00	120.000000	0.00	;;Pipe
467	398	400	437.90	12.00	120.000000	0.00	;;Pipe
479	410	412	455.45	6.00	120.000000	0.00	;;Pipe
481	412	408	937.09	6.00	120.000000	0.00	;;Pipe
483	410	390	316.51	6.00	120.000000	0.00	;;Pipe
485	410	414	382.86	6.00	120.000000	0.00	;;Pipe
487	414	416	439.75	6.00	120.000000	0.00	;;Pipe
489	416	412	382.75	6.00	120.000000	0.00	;;Pipe
491	414	418	277.17	6.00	120.000000	0.00	;;Pipe
493	418	420	267.04	6.00	120.000000	0.00	;;Pipe
495	420	426	512.43	6.00	120.000000	0.00	;;Pipe
497	418	422	230.34	6.00	120.000000	0.00	;;Pipe
499	422	424	512.43	6.00	120.000000	0.00	;;Pipe
501	416	428	146.50	6.00	120.000000	0.00	;;Pipe
503	428	430	429.31	6.00	120.000000	0.00	;;Pipe
505	430	432	643.14	6.00	120.000000	0.00	;;Pipe
509	426	424	497.36	8.00	120.000000	0.00	;;Pipe
511	432	434	486.86	8.00	120.000000	0.00	;;Pipe
519	438	440	486.14	6.00	120.000000	0.00	;;Pipe
521	222	442	708.83	6.00	120.000000	0.00	;;Pipe
527	426	444	196.07	8.00	120.000000	0.00	;;Pipe
529	444	432	427.04	8.00	120.000000	0.00	;;Pipe
531	428	444	641.51	6.00	120.000000	0.00	;;Pipe
533	424	446	141.24	6.00	120.000000	0.00	;;Pipe
535	446	448	905.75	6.00	120.000000	0.00	;;Pipe
537	440	448	867.33	6.00	120.000000	0.00	;;Pipe
539	440	450	278.86	6.00	120.000000	0.00	;;Pipe
541	450	452	683.75	6.00	120.000000	0.00	;;Pipe
543	452	460	532.45	6.00	120.000000	0.00	;;Pipe
545	460	466	312.54	6.00	120.000000	0.00	;;Pipe
547	460	462	417.22	6.00	120.000000	0.00	;;Pipe
549	462	464	308.66	6.00	120.000000	0.00	;;Pipe
551	448	468	318.32	6.00	120.000000	0.00	;;Pipe
553	468	466	645.28	6.00	120.000000	0.00	;;Pipe
555	466	464	413.34	6.00	120.000000	0.00	;;Pipe
557	462	470	231.97	6.00	120.000000	0.00	;;Pipe
559	470	472	389.80	6.00	120.000000	0.00	;;Pipe
561	472	474	659.03	6.00	120.000000	0.00	;;Pipe
563	474	476	718.04	6.00	120.000000	0.00	;;Pipe
565	476	478	335.01	4.00	120.000000	0.00	;;Pipe

567	478	464	578.19	6.00	120.000000	0.00	::Pipe
569	476	480	292.13	4.00	120.000000	0.00	::Pipe
571	476	482	676.52	6.00	120.000000	0.00	::Pipe
575	484	482	297.50	6.00	120.000000	0.00	::Pipe
577	480	498	477.78	4.00	120.000000	0.00	::Pipe
579	498	494	664.12	4.00	120.000000	0.00	::Pipe
581	494	492	646.63	4.00	120.000000	0.00	::Pipe
583	492	490	481.21	4.00	120.000000	0.00	::Pipe
585	490	488	297.50	4.00	120.000000	0.00	::Pipe
587	488	482	655.43	4.00	120.000000	0.00	::Pipe
589	496	486	651.23	6.00	120.000000	0.00	::Pipe
591	486	494	704.35	6.00	120.000000	0.00	::Pipe
593	494	484	472.47	6.00	120.000000	0.00	::Pipe
595	496	492	721.80	4.00	120.000000	0.00	::Pipe
597	506	508	240.34	6.00	120.000000	0.00	::Pipe
599	508	502	463.78	6.00	120.000000	0.00	::Pipe
601	504	502	235.93	6.00	120.000000	0.00	::Pipe
603	506	504	468.25	6.00	120.000000	0.00	::Pipe
605	502	500	371.40	6.00	120.000000	0.00	::Pipe
607	500	496	1963.06	6.00	120.000000	0.00	::Pipe
609	464	510	1343.31	6.00	120.000000	0.00	::Pipe
611	510	512	581.82	6.00	120.000000	0.00	::Pipe
613	512	478	1324.08	4.00	120.000000	0.00	::Pipe
615	512	488	330.25	4.00	120.000000	0.00	::Pipe
617	510	514	232.01	6.00	120.000000	0.00	::Pipe
623	514	516	835.57	6.00	120.000000	0.00	::Pipe
625	516	518	991.94	6.00	120.000000	0.00	::Pipe
627	518	468	334.84	6.00	120.000000	0.00	::Pipe
629	518	520	157.48	6.00	120.000000	0.00	::Pipe
635	520	524	170.66	6.00	120.000000	0.00	::Pipe
637	524	448	331.40	6.00	120.000000	0.00	::Pipe
639	516	536	319.24	6.00	120.000000	0.00	::Pipe
641	514	526	304.22	6.00	120.000000	0.00	::Pipe
643	526	528	329.30	6.00	120.000000	0.00	::Pipe
645	528	530	262.15	6.00	120.000000	0.00	::Pipe
647	530	532	408.52	6.00	120.000000	0.00	::Pipe
649	532	534	1071.76	6.00	120.000000	0.00	::Pipe
651	534	536	581.09	6.00	120.000000	0.00	::Pipe
655	446	538	283.12	6.00	120.000000	0.00	::Pipe
657	536	540	221.72	6.00	120.000000	0.00	::Pipe
659	540	524	777.43	6.00	120.000000	0.00	::Pipe
661	538	542	808.33	6.00	120.000000	0.00	::Pipe
663	542	540	883.69	6.00	120.000000	0.00	::Pipe
665	542	546	692.05	6.00	120.000000	0.00	::Pipe
667	546	544	441.91	6.00	120.000000	0.00	::Pipe
669	544	534	465.92	6.00	120.000000	0.00	::Pipe
671	546	548	867.46	6.00	120.000000	0.00	::Pipe
673	554	552	883.82	6.00	120.000000	0.00	::Pipe
675	552	548	314.62	6.00	120.000000	0.00	::Pipe
677	548	550	888.94	6.00	120.000000	0.00	::Pipe
681	562	560	328.57	6.00	120.000000	0.00	::Pipe
683	562	564	826.05	6.00	120.000000	0.00	::Pipe
685	564	558	317.60	6.00	120.000000	0.00	::Pipe
687	558	560	829.78	6.00	120.000000	0.00	::Pipe
689	558	556	299.74	6.00	120.000000	0.00	::Pipe
691	556	566	485.22	6.00	120.000000	0.00	::Pipe
693	566	434	40.87	6.00	120.000000	0.00	::Pipe

695	574	570	1396.72	6.00	120.000000	0.00	;;Pipe
697	570	568	639.73	6.00	120.000000	0.00	;;Pipe
699	570	572	628.68	6.00	120.000000	0.00	;;Pipe
701	572	554	154.13	6.00	120.000000	0.00	;;Pipe
705	548	580	535.89	6.00	120.000000	0.00	;;Pipe
707	580	582	456.12	6.00	120.000000	0.00	;;Pipe
723	574	576	644.55	4.00	120.000000	0.00	;;Pipe
731	594	598	230.15	6.00	120.000000	0.00	;;Pipe
735	598	602	263.89	6.00	120.000000	0.00	;;Pipe
737	534	602	572.43	6.00	120.000000	0.00	;;Pipe
739	602	600	219.65	6.00	120.000000	0.00	;;Pipe
745	608	604	277.60	10.00	120.000000	0.00	;;Pipe
747	604	606	626.03	10.00	120.000000	0.00	;;Pipe
749	606	600	1074.50	10.00	120.000000	0.00	;;Pipe
751	612	604	505.63	10.00	120.000000	0.00	;;Pipe
755	616	600	1344.35	6.00	120.000000	0.00	;;Pipe
757	628	618	418.35	6.00	120.000000	0.00	;;Pipe
759	618	620	917.92	6.00	120.000000	0.00	;;Pipe
761	620	622	504.38	6.00	120.000000	0.00	;;Pipe
763	622	624	293.87	6.00	120.000000	0.00	;;Pipe
765	624	630	283.24	6.00	120.000000	0.00	;;Pipe
767	630	626	1193.89	6.00	120.000000	0.00	;;Pipe
769	630	632	525.69	6.00	120.000000	0.00	;;Pipe
771	632	634	1182.59	6.00	120.000000	0.00	;;Pipe
779	634	638	631.99	8.00	120.000000	0.00	;;Pipe
781	638	640	480.62	8.00	120.000000	0.00	;;Pipe
783	634	642	174.92	8.00	120.000000	0.00	;;Pipe
785	642	626	342.08	8.00	120.000000	0.00	;;Pipe
787	626	200	1020.98	8.00	120.000000	0.00	;;Pipe
789	644	646	1302.35	8.00	120.000000	0.00	;;Pipe
791	644	240	1329.97	10.00	120.000000	0.00	;;Pipe
793	652	650	596.21	8.00	120.000000	0.00	;;Pipe
795	650	648	698.18	6.00	120.000000	0.00	;;Pipe
797	648	644	628.31	6.00	120.000000	0.00	;;Pipe
799	646	652	651.92	12.00	120.000000	0.00	;;Pipe
801	652	654	802.72	12.00	120.000000	0.00	;;Pipe
803	646	658	344.15	12.00	120.000000	0.00	;;Pipe
805	658	656	337.81	12.00	120.000000	0.00	;;Pipe
807	656	640	1884.89	12.00	120.000000	0.00	;;Pipe
809	658	662	1350.84	6.00	120.000000	0.00	;;Pipe
813	660	664	172.78	6.00	120.000000	0.00	;;Pipe
815	664	662	149.22	6.00	120.000000	0.00	;;Pipe
817	664	666	613.44	6.00	120.000000	0.00	;;Pipe
819	666	672	204.42	8.00	120.000000	0.00	;;Pipe
821	672	670	149.43	10.00	120.000000	0.00	;;Pipe
823	670	668	690.47	12.00	120.000000	0.00	;;Pipe
825	676	674	369.21	6.00	120.000000	0.00	;;Pipe
827	674	666	306.49	6.00	120.000000	0.00	;;Pipe
829	674	678	682.49	6.00	120.000000	0.00	;;Pipe
831	712	708	474.83	6.00	120.000000	0.00	;;Pipe
833	708	710	329.95	6.00	120.000000	0.00	;;Pipe
835	708	706	525.56	6.00	120.000000	0.00	;;Pipe
837	706	702	691.14	6.00	120.000000	0.00	;;Pipe
839	702	704	290.70	6.00	120.000000	0.00	;;Pipe
841	702	700	1045.62	6.00	120.000000	0.00	;;Pipe
843	712	700	638.08	6.00	120.000000	0.00	;;Pipe
845	700	698	290.70	6.00	120.000000	0.00	;;Pipe

847	710	684	849.52	6.00	120.000000	0.00	::Pipe
849	684	694	1319.45	6.00	120.000000	0.00	::Pipe
851	686	696	1311.62	6.00	120.000000	0.00	::Pipe
853	686	688	164.73	6.00	120.000000	0.00	::Pipe
855	688	690	816.84	6.00	120.000000	0.00	::Pipe
857	690	692	514.34	6.00	120.000000	0.00	::Pipe
859	692	684	1007.68	6.00	120.000000	0.00	::Pipe
861	716	692	289.41	6.00	120.000000	0.00	::Pipe
863	716	680	1059.97	10.00	120.000000	0.00	::Pipe
883	718	680	1129.39	12.00	120.000000	0.00	::Pipe
885	720	718	678.92	10.00	120.000000	0.00	::Pipe
897	728	616	1268.17	6.00	120.000000	0.00	::Pipe
899	246	730	1332.26	12.00	120.000000	0.00	::Pipe
901	730	732	1151.34	12.00	120.000000	0.00	::Pipe
903	732	734	268.73	10.00	120.000000	0.00	::Pipe
905	734	736	67.67	10.00	120.000000	0.00	::Pipe
907	736	742	1025.31	6.00	120.000000	0.00	::Pipe
909	742	744	302.17	6.00	120.000000	0.00	::Pipe
911	744	746	168.29	6.00	120.000000	0.00	::Pipe
913	746	654	603.87	6.00	120.000000	0.00	::Pipe
915	744	740	1016.87	6.00	120.000000	0.00	::Pipe
917	736	738	251.81	12.00	120.000000	0.00	::Pipe
919	740	748	621.12	12.00	120.000000	0.00	::Pipe
921	748	654	1185.46	12.00	120.000000	0.00	::Pipe
923	284	768	222.74	8.00	120.000000	0.00	::Pipe
925	768	766	251.95	8.00	120.000000	0.00	::Pipe
927	766	764	285.51	8.00	120.000000	0.00	::Pipe
929	764	762	554.04	8.00	120.000000	0.00	::Pipe
931	762	758	352.53	8.00	120.000000	0.00	::Pipe
933	758	760	394.50	8.00	120.000000	0.00	::Pipe
935	770	760	579.22	8.00	120.000000	0.00	::Pipe
937	758	750	666.93	8.00	120.000000	0.00	::Pipe
939	750	734	664.12	8.00	120.000000	0.00	::Pipe
941	750	752	344.14	8.00	120.000000	0.00	::Pipe
943	752	738	672.37	10.00	120.000000	0.00	::Pipe
945	752	754	67.15	10.00	120.000000	0.00	::Pipe
947	754	760	664.12	10.00	120.000000	0.00	::Pipe
949	754	756	571.01	10.00	120.000000	0.00	::Pipe
951	780	768	967.76	6.00	120.000000	0.00	::Pipe
953	780	778	243.41	6.00	120.000000	0.00	::Pipe
955	778	766	958.97	6.00	120.000000	0.00	::Pipe
957	778	776	251.95	6.00	120.000000	0.00	::Pipe
959	776	772	841.42	6.00	120.000000	0.00	::Pipe
961	772	774	159.89	6.00	120.000000	0.00	::Pipe
963	774	750	310.56	6.00	120.000000	0.00	::Pipe
965	762	772	504.24	6.00	120.000000	0.00	::Pipe
967	764	776	958.08	6.00	120.000000	0.00	::Pipe
969	774	782	655.51	6.00	120.000000	0.00	::Pipe
971	782	732	61.11	6.00	120.000000	0.00	::Pipe
973	786	784	999.15	6.00	120.000000	0.00	::Pipe
975	784	762	1218.60	6.00	120.000000	0.00	::Pipe
977	786	314	376.67	8.00	120.000000	0.00	::Pipe
979	758	790	1527.76	8.00	120.000000	0.00	::Pipe
981	784	788	301.35	6.00	120.000000	0.00	::Pipe
983	788	790	363.15	6.00	120.000000	0.00	::Pipe
985	790	792	379.24	6.00	120.000000	0.00	::Pipe
987	792	794	571.56	10.00	120.000000	0.00	::Pipe

989	792	796	713.60	10.00	120.000000	0.00	;;Pipe
991	796	798	591.73	12.00	120.000000	0.00	;;Pipe
993	802	800	356.36	12.00	120.000000	0.00	;;Pipe
995	800	796	383.31	12.00	120.000000	0.00	;;Pipe
997	802	804	40.39	12.00	120.000000	0.00	;;Pipe
999	128	804	1328.04	12.00	120.000000	0.00	;;Pipe
1001	800	790	713.61	8.00	120.000000	0.00	;;Pipe
1003	788	804	679.94	6.00	120.000000	0.00	;;Pipe
1005	806	810	390.46	8.00	120.000000	0.00	;;Pipe
1007	810	800	397.19	8.00	120.000000	0.00	;;Pipe
1009	810	812	390.04	8.00	120.000000	0.00	;;Pipe
1011	808	802	774.21	6.00	120.000000	0.00	;;Pipe
1013	808	806	349.90	6.00	120.000000	0.00	;;Pipe
1015	806	814	390.04	6.00	120.000000	0.00	;;Pipe
1017	814	816	571.56	6.00	120.000000	0.00	;;Pipe
1019	812	818	578.28	6.00	120.000000	0.00	;;Pipe
1025	816	820	138.34	12.00	120.000000	0.00	;;Pipe
1027	798	794	713.88	10.00	120.000000	0.00	;;Pipe
1029	794	822	312.48	10.00	120.000000	0.00	;;Pipe
1031	822	770	1206.24	8.00	120.000000	0.00	;;Pipe
1033	770	756	655.99	6.00	120.000000	0.00	;;Pipe
1035	756	748	698.33	6.00	120.000000	0.00	;;Pipe
1037	654	824	1347.87	12.00	120.000000	0.00	;;Pipe
1039	826	824	1187.81	8.00	120.000000	0.00	;;Pipe
1043	826	828	636.15	8.00	120.000000	0.00	;;Pipe
1045	824	830	661.00	12.00	120.000000	0.00	;;Pipe
1047	830	720	662.16	12.00	120.000000	0.00	;;Pipe
1059	720	842	846.95	10.00	120.000000	0.00	;;Pipe
1071	856	854	1960.78	6.00	120.000000	0.00	;;Pipe
1073	850	848	1977.52	10.00	120.000000	0.00	;;Pipe
1075	850	856	354.79	10.00	120.000000	0.00	;;Pipe
1077	856	852	395.94	10.00	120.000000	0.00	;;Pipe
1079	852	842	660.10	10.00	120.000000	0.00	;;Pipe
1081	848	858	668.19	12.00	120.000000	0.00	;;Pipe
1083	858	862	321.41	12.00	120.000000	0.00	;;Pipe
1085	862	864	626.90	6.00	120.000000	0.00	;;Pipe
1087	858	860	635.20	12.00	120.000000	0.00	;;Pipe
1089	866	864	1647.89	8.00	120.000000	0.00	;;Pipe
1091	864	860	329.54	8.00	120.000000	0.00	;;Pipe
1155	932	936	140.47	12.00	120.000000	0.00	;;Pipe
1167	928	952	463.05	14.00	120.000000	0.00	;;Pipe
1169	952	950	972.28	14.00	120.000000	0.00	;;Pipe
1179	950	948	396.02	10.00	120.000000	0.00	;;Pipe
1181	944	942	331.24	12.00	120.000000	0.00	;;Pipe
1183	942	866	333.81	12.00	120.000000	0.00	;;Pipe
1185	944	946	330.87	10.00	120.000000	0.00	;;Pipe
1187	946	948	478.49	10.00	120.000000	0.00	;;Pipe
1193	928	926	923.63	14.00	120.000000	0.00	;;Pipe
1195	926	924	362.94	12.00	120.000000	0.00	;;Pipe
1197	924	922	355.07	12.00	120.000000	0.00	;;Pipe
1199	922	920	363.03	12.00	120.000000	0.00	;;Pipe
1201	920	918	346.54	12.00	120.000000	0.00	;;Pipe
1203	918	874	350.75	12.00	120.000000	0.00	;;Pipe
1209	958	972	1065.20	14.00	120.000000	0.00	;;Pipe
1211	972	820	1263.17	14.00	120.000000	0.00	;;Pipe
1213	958	960	249.35	8.00	120.000000	0.00	;;Pipe
1215	960	962	387.77	8.00	120.000000	0.00	;;Pipe

1223	966	968	972.46	8.00	120.000000	0.00	;;Pipe
1225	904	974	218.21	12.00	120.000000	0.00	;;Pipe
1227	974	926	823.91	12.00	120.000000	0.00	;;Pipe
1229	850	996	465.83	10.00	120.000000	0.00	;;Pipe
1231	996	866	830.00	6.00	120.000000	0.00	;;Pipe
1233	996	994	700.47	10.00	120.000000	0.00	;;Pipe
1235	994	986	584.94	10.00	120.000000	0.00	;;Pipe
1237	986	990	487.30	10.00	120.000000	0.00	;;Pipe
1239	994	992	346.54	10.00	120.000000	0.00	;;Pipe
1241	998	850	1302.57	6.00	120.000000	0.00	;;Pipe
1243	992	2002	495.00	8.00	120.000000	0.00	;;Pipe
1245	2002	984	577.55	8.00	120.000000	0.00	;;Pipe
1247	2002	866	721.77	8.00	120.000000	0.00	;;Pipe
1249	2000	866	704.87	8.00	120.000000	0.00	;;Pipe
1251	984	2004	800.99	8.00	120.000000	0.00	;;Pipe
1253	2004	998	560.95	8.00	120.000000	0.00	;;Pipe
1255	998	990	54.97	10.00	120.000000	0.00	;;Pipe
1257	990	2006	669.19	10.00	120.000000	0.00	;;Pipe
1259	2008	826	649.77	8.00	120.000000	0.00	;;Pipe
1261	2008	852	1299.00	8.00	120.000000	0.00	;;Pipe
1263	2008	998	651.68	8.00	120.000000	0.00	;;Pipe
1265	2006	756	1354.98	10.00	120.000000	0.00	;;Pipe
1267	990	770	1312.50	8.00	120.000000	0.00	;;Pipe
1269	984	982	330.05	8.00	120.000000	0.00	;;Pipe
1271	982	980	321.70	8.00	120.000000	0.00	;;Pipe
1273	980	978	395.94	8.00	120.000000	0.00	;;Pipe
1275	978	976	407.20	8.00	120.000000	0.00	;;Pipe
1277	976	972	371.19	8.00	120.000000	0.00	;;Pipe
1287	798	2012	159.17	12.00	120.000000	0.00	;;Pipe
1289	2012	818	238.59	12.00	120.000000	0.00	;;Pipe
1291	818	2010	155.95	12.00	120.000000	0.00	;;Pipe
1293	2010	816	234.90	12.00	120.000000	0.00	;;Pipe
1299	2014	820	399.08	12.00	120.000000	0.00	;;Pipe
1303	2020	2018	1262.10	8.00	120.000000	0.00	;;Pipe
1305	2018	972	414.36	8.00	120.000000	0.00	;;Pipe
1307	2020	820	420.22	8.00	120.000000	0.00	;;Pipe
1313	2024	136	123.24	6.00	120.000000	0.00	;;Pipe
1315	2024	2026	174.03	6.00	120.000000	0.00	;;Pipe
1319	2030	2026	1125.77	6.00	120.000000	0.00	;;Pipe
1321	2030	808	440.14	6.00	120.000000	0.00	;;Pipe
1337	2040	138	204.14	8.00	120.000000	0.00	;;Pipe
1341	2014	2044	294.96	12.00	120.000000	0.00	;;Pipe
1343	2044	2048	172.11	12.00	120.000000	0.00	;;Pipe
1345	2048	2046	200.10	12.00	120.000000	0.00	;;Pipe
1347	2046	2042	317.23	12.00	120.000000	0.00	;;Pipe
1349	2042	2050	299.12	12.00	120.000000	0.00	;;Pipe
1355	2050	362	2593.84	10.00	120.000000	0.00	;;Pipe
1361	2054	338	1272.19	8.00	120.000000	0.00	;;Pipe
1363	2054	2062	1330.26	8.00	120.000000	0.00	;;Pipe
1365	2064	2054	558.97	8.00	120.000000	0.00	;;Pipe
1373	2076	2074	398.17	8.00	120.000000	0.00	;;Pipe
1375	2074	2072	172.13	8.00	120.000000	0.00	;;Pipe
1379	2078	2062	1306.20	8.00	120.000000	0.00	;;Pipe
1383	2082	2076	1306.24	8.00	120.000000	0.00	;;Pipe
1385	2082	2084	271.56	8.00	120.000000	0.00	;;Pipe
1387	2086	2092	1024.22	6.00	120.000000	0.00	;;Pipe
1389	2092	2094	117.96	6.00	120.000000	0.00	;;Pipe

1391	2094	2090	108.94	6.00	120.000000	0.00	;;Pipe
1393	2090	2088	1005.50	6.00	120.000000	0.00	;;Pipe
1395	2086	2088	272.02	6.00	120.000000	0.00	;;Pipe
1397	2088	2082	282.79	6.00	120.000000	0.00	;;Pipe
1399	2094	2074	264.72	6.00	120.000000	0.00	;;Pipe
1401	2098	2086	1332.49	6.00	120.000000	0.00	;;Pipe
1403	2098	2096	560.92	6.00	120.000000	0.00	;;Pipe
1405	2096	2082	1314.35	6.00	120.000000	0.00	;;Pipe
1421	2124	2122	796.19	6.00	120.000000	0.00	;;Pipe
1423	2122	2086	788.88	6.00	120.000000	0.00	;;Pipe
1443	2076	2134	966.53	8.00	120.000000	0.00	;;Pipe
1495	2188	2152	867.70	12.00	120.000000	0.00	;;Pipe
1497	2188	2190	1259.11	12.00	120.000000	0.00	;;Pipe
1499	2190	2192	1177.60	12.00	120.000000	0.00	;;Pipe
1501	2154	2194	934.86	6.00	120.000000	0.00	;;Pipe
1503	2194	2196	371.52	6.00	120.000000	0.00	;;Pipe
1505	2196	2190	678.77	6.00	120.000000	0.00	;;Pipe
1507	2192	2198	362.78	10.00	120.000000	0.00	;;Pipe
1509	2214	2212	621.89	10.00	120.000000	0.00	;;Pipe
1511	2214	2216	662.28	8.00	120.000000	0.00	;;Pipe
1513	2212	2210	450.94	10.00	120.000000	0.00	;;Pipe
1515	2210	2208	217.59	10.00	120.000000	0.00	;;Pipe
1517	2208	2206	190.85	8.00	120.000000	0.00	;;Pipe
1519	2206	2204	1385.94	8.00	120.000000	0.00	;;Pipe
1521	2204	2202	960.94	10.00	120.000000	0.00	;;Pipe
1527	2240	2202	987.40	12.00	120.000000	0.00	;;Pipe
1529	2240	2200	398.96	12.00	120.000000	0.00	;;Pipe
1531	2198	2200	1234.56	12.00	120.000000	0.00	;;Pipe
1533	2200	904	1009.27	12.00	120.000000	0.00	;;Pipe
1539	2202	968	1599.15	8.00	120.000000	0.00	;;Pipe
1541	2204	2246	54.38	10.00	120.000000	0.00	;;Pipe
1549	2244	966	995.30	8.00	120.000000	0.00	;;Pipe
1551	2132	2222	149.63	8.00	120.000000	0.00	;;Pipe
1553	2222	2228	878.65	8.00	120.000000	0.00	;;Pipe
1555	2228	2226	426.12	8.00	120.000000	0.00	;;Pipe
1561	2220	2218	334.86	6.00	120.000000	0.00	;;Pipe
1563	2218	2216	181.16	6.00	120.000000	0.00	;;Pipe
1567	2250	2230	314.12	6.00	120.000000	0.00	;;Pipe
1577	2078	2256	646.88	6.00	120.000000	0.00	;;Pipe
1579	2256	2254	489.23	6.00	120.000000	0.00	;;Pipe
1581	2254	2252	751.89	6.00	120.000000	0.00	;;Pipe
1583	2252	2226	654.13	8.00	120.000000	0.00	;;Pipe
1587	2224	2206	1015.22	6.00	120.000000	0.00	;;Pipe
1599	2268	2266	995.34	10.00	120.000000	0.00	;;Pipe
1601	2268	2270	245.24	8.00	120.000000	0.00	;;Pipe
1603	2270	2280	307.73	8.00	120.000000	0.00	;;Pipe
1605	2270	2264	977.09	6.00	120.000000	0.00	;;Pipe
1607	2278	2272	325.69	6.00	120.000000	0.00	;;Pipe
1609	2272	2274	326.10	6.00	120.000000	0.00	;;Pipe
1611	2274	2276	317.17	6.00	120.000000	0.00	;;Pipe
1613	2276	2258	968.21	6.00	120.000000	0.00	;;Pipe
1615	2274	2260	968.72	6.00	120.000000	0.00	;;Pipe
1617	2272	2262	968.72	6.00	120.000000	0.00	;;Pipe
1619	2272	2270	308.11	6.00	120.000000	0.00	;;Pipe
1621	2252	2288	309.73	8.00	120.000000	0.00	;;Pipe
1623	2288	2062	343.25	8.00	120.000000	0.00	;;Pipe
1625	2288	2276	181.39	6.00	120.000000	0.00	;;Pipe

1627	2062	2290	461.68	8.00	120.000000	0.00	::Pipe
1629	2290	2278	344.33	6.00	120.000000	0.00	::Pipe
1631	2278	2280	299.06	6.00	120.000000	0.00	::Pipe
1633	2280	2052	248.10	6.00	120.000000	0.00	::Pipe
1635	2268	2282	163.30	10.00	120.000000	0.00	::Pipe
1637	2282	2284	145.21	10.00	120.000000	0.00	::Pipe
1639	2284	2050	303.95	10.00	120.000000	0.00	::Pipe
1641	2266	2292	317.04	10.00	120.000000	0.00	::Pipe
1643	2292	2286	597.91	8.00	120.000000	0.00	::Pipe
1649	2266	2294	280.61	10.00	120.000000	0.00	::Pipe
1651	2294	2296	316.65	10.00	120.000000	0.00	::Pipe
1653	2296	2298	298.55	10.00	120.000000	0.00	::Pipe
1655	2300	2298	118.10	8.00	120.000000	0.00	::Pipe
1659	2296	2302	302.18	10.00	120.000000	0.00	::Pipe
1701	2308	2286	356.44	8.00	120.000000	0.00	::Pipe
1703	86	1000	99.34	6.00	120.000000	0.00	::Pipe
1705	2350	2348	444.83	6.00	120.000000	0.00	::Pipe
1707	2348	2338	642.55	6.00	120.000000	0.00	::Pipe
1709	2338	2340	296.64	6.00	120.000000	0.00	::Pipe
1711	2340	40	995.93	6.00	120.000000	0.00	::Pipe
1713	2340	2342	291.26	6.00	120.000000	0.00	::Pipe
1715	2342	2344	181.75	6.00	120.000000	0.00	::Pipe
1717	2344	2346	335.04	6.00	120.000000	0.00	::Pipe
1719	2346	2348	477.47	6.00	120.000000	0.00	::Pipe
1721	2350	54	1285.32	6.00	120.000000	0.00	::Pipe
1723	2346	42	791.01	6.00	120.000000	0.00	::Pipe
1725	2360	240	594.19	12.00	120.000000	0.00	::Pipe
1727	2362	2360	344.76	12.00	120.000000	0.00	::Pipe
1729	2362	2356	434.73	8.00	120.000000	0.00	::Pipe
1731	2356	2354	97.96	8.00	120.000000	0.00	::Pipe
1733	2354	2352	316.76	8.00	120.000000	0.00	::Pipe
1735	2352	2358	446.38	8.00	120.000000	0.00	::Pipe
1737	2358	2360	761.70	8.00	120.000000	0.00	::Pipe
1741	2030	2020	1300.00	4.00	120.000000	0.00	::Pipe
1743	840	2366	202.41	12.00	120.000000	0.00	::Pipe
1745	2366	2368	366.22	12.00	120.000000	0.00	::Pipe
1747	2368	2370	663.97	12.00	120.000000	0.00	::Pipe
1749	2370	2376	685.47	12.00	120.000000	0.00	::Pipe
1751	2376	2378	641.60	12.00	120.000000	0.00	::Pipe
1753	2378	2382	641.60	12.00	120.000000	0.00	::Pipe
1755	2382	2384	298.12	12.00	120.000000	0.00	::Pipe
1757	2384	2386	641.60	12.00	120.000000	0.00	::Pipe
1759	2386	2080	372.97	12.00	120.000000	0.00	::Pipe
1761	2368	2372	1296.51	8.00	120.000000	0.00	::Pipe
1763	2372	2374	663.93	8.00	120.000000	0.00	::Pipe
1765	2374	2380	656.51	8.00	120.000000	0.00	::Pipe
1767	2380	2378	618.41	8.00	120.000000	0.00	::Pipe
1769	2376	2374	618.59	10.00	120.000000	0.00	::Pipe
1771	2374	2394	822.32	10.00	120.000000	0.00	::Pipe
1773	2394	2392	581.92	10.00	120.000000	0.00	::Pipe
1775	2392	2390	59.61	10.00	120.000000	0.00	::Pipe
1777	2390	2388	678.89	10.00	120.000000	0.00	::Pipe
1779	2388	2424	774.92	8.00	120.000000	0.00	::Pipe
1781	2410	2412	305.94	8.00	120.000000	0.00	::Pipe
1783	2408	2410	529.70	8.00	120.000000	0.00	::Pipe
1785	2412	2406	298.48	8.00	120.000000	0.00	::Pipe
1787	2410	2398	764.44	8.00	120.000000	0.00	::Pipe

1789	2398	2396	522.19	8.00	120.000000	0.00	;;Pipe
1791	2386	2396	151.48	10.00	120.000000	0.00	;;Pipe
1793	2396	2408	774.91	10.00	120.000000	0.00	;;Pipe
1795	2414	2408	797.37	10.00	120.000000	0.00	;;Pipe
1797	2406	2402	1289.00	8.00	120.000000	0.00	;;Pipe
1799	2400	2412	1294.86	8.00	120.000000	0.00	;;Pipe
1801	2080	2400	823.29	12.00	120.000000	0.00	;;Pipe
1803	2400	2402	305.86	12.00	120.000000	0.00	;;Pipe
1809	2418	2416	777.63	8.00	120.000000	0.00	;;Pipe
1811	2416	2406	725.14	8.00	120.000000	0.00	;;Pipe
1813	2416	2404	1288.99	8.00	120.000000	0.00	;;Pipe
1815	884	2418	469.05	8.00	120.000000	0.00	;;Pipe
1817	878	2420	642.57	8.00	120.000000	0.00	;;Pipe
1819	2420	2422	290.67	8.00	120.000000	0.00	;;Pipe
1821	2422	880	642.14	8.00	120.000000	0.00	;;Pipe
1823	876	2404	834.15	12.00	120.000000	0.00	;;Pipe
1825	2424	2382	635.49	8.00	120.000000	0.00	;;Pipe
1827	2408	2424	654.03	8.00	120.000000	0.00	;;Pipe
1829	2434	912	1948.64	12.00	120.000000	0.00	;;Pipe
1831	912	2426	707.61	12.00	120.000000	0.00	;;Pipe
1833	2426	2428	876.85	12.00	120.000000	0.00	;;Pipe
1835	2428	2430	997.44	12.00	120.000000	0.00	;;Pipe
1837	2430	2432	923.92	12.00	120.000000	0.00	;;Pipe
1841	2438	2436	698.00	8.00	120.000000	0.00	;;Pipe
1843	2436	2426	535.76	8.00	120.000000	0.00	;;Pipe
1845	2444	906	605.90	8.00	120.000000	0.00	;;Pipe
1847	914	2442	255.51	8.00	120.000000	0.00	;;Pipe
1849	2442	2440	837.03	8.00	120.000000	0.00	;;Pipe
1851	2440	2432	669.09	12.00	120.000000	0.00	;;Pipe
1853	2192	2450	397.56	12.00	120.000000	0.00	;;Pipe
1855	2450	2452	1448.69	12.00	120.000000	0.00	;;Pipe
1857	2452	2440	263.06	12.00	120.000000	0.00	;;Pipe
1859	2440	2446	583.28	6.00	120.000000	0.00	;;Pipe
1861	2458	2456	552.23	6.00	120.000000	0.00	;;Pipe
1863	2456	2452	604.67	6.00	120.000000	0.00	;;Pipe
1865	2458	2460	380.06	6.00	120.000000	0.00	;;Pipe
1867	2456	2454	335.37	6.00	120.000000	0.00	;;Pipe
1869	2460	2454	567.74	6.00	120.000000	0.00	;;Pipe
1871	2454	2446	134.91	6.00	120.000000	0.00	;;Pipe
1873	2446	2448	602.03	6.00	120.000000	0.00	;;Pipe
1875	2474	2476	1223.45	6.00	120.000000	0.00	;;Pipe
1877	2476	2466	290.96	6.00	120.000000	0.00	;;Pipe
1879	2466	2468	1208.50	6.00	120.000000	0.00	;;Pipe
1881	2474	2468	298.03	6.00	120.000000	0.00	;;Pipe
1883	2466	2464	499.42	6.00	120.000000	0.00	;;Pipe
1885	2464	2462	1075.16	6.00	120.000000	0.00	;;Pipe
1887	2462	2478	794.93	6.00	120.000000	0.00	;;Pipe
1889	2468	2470	521.55	8.00	120.000000	0.00	;;Pipe
1891	2470	2472	500.04	8.00	120.000000	0.00	;;Pipe
1893	2478	2448	487.85	6.00	120.000000	0.00	;;Pipe
1895	2478	2480	1152.01	6.00	120.000000	0.00	;;Pipe
1897	2480	2430	1563.60	6.00	120.000000	0.00	;;Pipe
1899	2482	2450	1194.91	8.00	120.000000	0.00	;;Pipe
1901	2482	2190	465.12	8.00	120.000000	0.00	;;Pipe
1903	2490	2488	456.08	8.00	120.000000	0.00	;;Pipe
1905	2488	2486	676.48	8.00	120.000000	0.00	;;Pipe
1907	2486	2484	417.29	8.00	120.000000	0.00	;;Pipe

113	104	110	210.28	8.00	100.000000	0.00	;;Pipe
115	110	112	796.91	8.00	100.000000	0.00	;;Pipe
117	112	108	641.29	8.00	100.000000	0.00	;;Pipe
1153	930	932	354.79	4.00	100.000000	0.00	;;Pipe
1157	936	934	222.87	4.00	100.000000	0.00	;;Pipe
1159	934	938	98.98	4.00	100.000000	0.00	;;Pipe
1161	938	916	255.71	4.00	100.000000	0.00	;;Pipe
1163	916	940	65.99	4.00	100.000000	0.00	;;Pipe
1165	940	864	296.64	4.00	100.000000	0.00	;;Pipe
1173	936	946	1419.03	4.00	100.000000	0.00	;;Pipe
1175	938	944	1435.34	4.00	100.000000	0.00	;;Pipe
1177	940	942	1542.58	4.00	100.000000	0.00	;;Pipe
1189	930	970	197.97	6.00	100.000000	0.00	;;Pipe
1191	970	928	190.43	6.00	100.000000	0.00	;;Pipe
1205	930	948	1426.98	4.00	100.000000	0.00	;;Pipe
1221	966	950	437.22	8.00	100.000000	0.00	;;Pipe
1279	976	948	1641.10	4.00	100.000000	0.00	;;Pipe
1281	978	946	1613.36	4.00	100.000000	0.00	;;Pipe
1283	980	944	1555.57	4.00	100.000000	0.00	;;Pipe
1285	982	942	1448.21	4.00	100.000000	0.00	;;Pipe
1295	2010	976	1274.38	4.00	100.000000	0.00	;;Pipe
1297	2012	978	1319.78	4.00	100.000000	0.00	;;Pipe
1323	2030	2032	724.66	6.00	100.000000	0.00	;;Pipe
1325	2034	2032	425.83	8.00	100.000000	0.00	;;Pipe
1327	2032	2038	1130.92	8.00	100.000000	0.00	;;Pipe
1329	2034	360	1303.74	4.00	100.000000	0.00	;;Pipe
1333	2038	2040	353.39	6.00	100.000000	0.00	;;Pipe
1335	2040	2026	625.61	6.00	100.000000	0.00	;;Pipe
1339	2034	2042	1285.70	8.00	100.000000	0.00	;;Pipe
1351	2050	2052	307.98	6.00	100.000000	0.00	;;Pipe
1353	2052	364	2610.47	4.00	100.000000	0.00	;;Pipe
1523	2234	2198	431.07	6.00	100.000000	0.00	;;Pipe
1525	2234	2240	1168.65	6.00	100.000000	0.00	;;Pipe
1535	2240	2242	2030.33	6.00	100.000000	0.00	;;Pipe
1537	2242	926	436.82	6.00	100.000000	0.00	;;Pipe
1543	2246	2244	543.49	8.00	100.000000	0.00	;;Pipe
1573	2224	2232	281.04	4.00	100.000000	0.00	;;Pipe
1575	2232	2226	298.55	6.00	100.000000	0.00	;;Pipe
1589	2226	2258	189.84	8.00	100.000000	0.00	;;Pipe
1591	2258	2260	299.06	8.00	100.000000	0.00	;;Pipe
1593	2260	2262	326.10	8.00	100.000000	0.00	;;Pipe
1595	2262	2264	344.21	8.00	100.000000	0.00	;;Pipe
1597	2264	2266	262.69	8.00	100.000000	0.00	;;Pipe
1657	2298	2246	702.92	10.00	100.000000	0.00	;;Pipe
379	1002	324	45.71	12.00	120.000000	0.00	;;Pipe
381	324	116	72.37	12.00	120.000000	0.00	;;Pipe
383	102	116	173.86	12.00	120.000000	0.00	;;Pipe
1217	962	964	131.82	12.00	120.000000	0.00	;;Pipe
1219	962	966	842.80	12.00	120.000000	0.00	;;Pipe
1545	2244	2248	36.19	12.00	120.000000	0.00	;;Pipe
1661	2302	2304	589.41	12.00	120.000000	0.00	;;Pipe
1663	2304	2306	353.39	12.00	120.000000	0.00	;;Pipe
1665	2306	964	296.17	12.00	120.000000	0.00	;;Pipe
1669	2316	2320	110.48	8.00	120.000000	0.00	;;Pipe
1671	2316	2286	687.00	8.00	120.000000	0.00	;;Pipe
1673	2316	2046	603.38	8.00	120.000000	0.00	;;Pipe
1675	2320	2310	249.43	12.00	120.000000	0.00	;;Pipe

1677	2310	2308	669.55	12.00	120.000000	0.00	;;Pipe
1679	2310	2044	620.60	12.00	120.000000	0.00	;;Pipe
1681	2286	2304	561.13	8.00	120.000000	0.00	;;Pipe
1683	2304	2322	455.97	8.00	120.000000	0.00	;;Pipe
1685	2308	2306	588.34	12.00	120.000000	0.00	;;Pipe
1687	2306	2324	366.43	8.00	120.000000	0.00	;;Pipe
1689	2248	2332	364.75	12.00	120.000000	0.00	;;Pipe
1691	2332	2328	238.40	12.00	120.000000	0.00	;;Pipe
1693	2328	966	392.71	12.00	120.000000	0.00	;;Pipe
1695	2334	2332	342.83	8.00	120.000000	0.00	;;Pipe
1697	2336	2328	383.47	8.00	120.000000	0.00	;;Pipe
1909	2100	2098	40.00	12.00	145.000000	0.00	;;Pipe
1911	2102	2096	40.00	12.00	145.000000	0.00	;;Pipe

[PUMPS]

;;ID	UpNd	DnNd	SOHd/HP	DsgnHd	DsgnFlw	HiHd	HiFlw	ExtFlw
	Description							
2002	1004	216	425.00	345.00	1000.00	300.00		1200.00
	;;Pump No. C-18							
2004	1006	234	550.00	351.00	823.00	196.00		1100.00
	;;Pump No. C-16							
2006	1008	262	440.00	310.00	550.00	160.00		800.00
	;;Pump No. C-10							
2010	276	280	60.00 45.00	1000.00	34.00 1300.00			;;Booster to
	3MG Scenic Heights							
2012	324	322	100.00	200.00				;;Booster to 50k Scenic Heights
2014	348	346	210.00	140.00	4000.00	60.00	5600.00	
	;;Booster to 3MG East Porterville							
2016	1014	506	201.00	448.00				;;Pump No. L-7
2018	1016	486	219.00	175.00				;;Pump No. L-1
2020	1018	486	230.00	325.00				;;Pump No. L-2
2026	1024	578	420.00	265.00	1271.00	170.00		1500.00
	;;Pump No. C-24							
2028	1026	598	248.00	291.00				;;Pump No. R-7
2030	1028	638	500.00	364.00	1426.00	220.00		2000.00
	;;Pump No. C-20							
2032	1030	672	360.00	271.00	1421.00	225.00		2000.00
	;;Pump No. C-17							
2034	1032	798	500.00	324.00	538.00	200.00		800.00
	;;Pump No. C-15							
2036	1034	714	380.00	320.00	1000.00	200.00		1400.00
	;;Pump No. C-25							
2038	1036	862	320.00	254.00	509.00	145.00		800.00
	;;Pump No. C-7							
2040	1038	844	450.00	339.00	800.00	210.00		1200.00
	;;Pump No. C-23							
2042	1040	874	500.00	318.00	783.00	250.00		1000.00
	;;Pump No. C-19							
2046	1044	970	360.00	249.00	404.00	90.00	790.00	
	;;Pump No. C-4							
2048	1046	958	460.00	319.00	643.00	248.00		800.00
	;;Pump No. C-3							
2050	2144	2146	80.00 74.00	220.00	30.00 450.00			;;Granite
	Hills Booster							
2052	1048	2264	283.00	469.00				;;Pump No. C-1
2056	1052	2300	440.00	298.00	374.00	153.00		500.00
	;;Pump No. C-11							

2060	1056	2364	420.00	278.00	1988.00	190.00	2400.00
	;; Pump NO. C-22						
2062	1058	530	205.00	463.00	;; Pump New L-5		

[VALVES]

;;ID	UpNd	DnNd	Diam	VlvTyp	Setting	MnrLoss	Description
3004	346	344	12.00	PRV	60.0000	0.0000	;;PRV-9 Plano/Henderson
3006	436	438	4.00	PRV	50.0000	0.0000	;;PRV-7 Mathew/Whitechapple
3008	614	728	6.00	PRV	45.0000	0.0000	;;PRV-1 Olive/Newcomb
3010	726	490	4.00	PRV	51.0000	0.0000	;;PRV-2 Newcomb/Putnam
3012	724	484	6.00	PRV	54.0000	0.0000	;;PRV-3 Newcomb/Thurman
3016	2134	2132	8.00	PRV	50.0000	0.0000	;;PRV-13 Putnam/wof Leggett
3018	2150	2152	12.00	PRV	50.0000	0.0000	;;PRV-14 Orange/Leggett
3020	2150	2154	6.00	PRV	52.0000	0.0000	;;PRV-15 Leggett/Orange
3022	50	218	10.00	PRV	65.0000	0.0000	;;PRV-4 Newcomb/Westfield
3024	24	2484	6.00	PRV	60.0000	0.0000	;;PRV-6 Newcomb/Castle
3026	28	2490	6.00	PRV	60.0000	0.0000	;;PRV-5 Newcomb/Median
3028	2058	2060	8.00	PRV	53.0000	0.0000	;;PRV-11 Grand/wof Leggett
3032	226	224	10.00	PRV	54.0000	0.0000	;;PRV-8 Henderson/Balmoral
3034	328	326	8.00	PRV	53.0000	0.0000	;;PRV-10 Plano/Mulberry
3038	346	332	12.00	prv	65.0000	0.0000	;;PRV-17 Henderson/Plano

[CONTROLS]

Link	2052	Open	If Node	2264	Below	40.00	;;Well No. C-1
Link	2052	Closed	If Node	2264	Above	73.00	;;Well No. C-1
Link	2048	Open	If Node	958	Below	40.00	;;Well No. C-3
Link	2048	Closed	If Node	958	Above	75.00	;;Well No. C-3
Link	2046	Open	If Node	970	Below	40.00	;;Well No. C-4
Link	2046	Closed	If Node	970	Above	73.00	;;Well No. C-4
Link	2038	Open	If Node	862	Below	42.00	;;Well No. C-7
Link	2038	Closed	If Node	862	Above	75.00	;;Well No. C-7
Link	2006	Open	If Node	262	Below	45.00	;;Well No. C-10
Link	2006	Closed	If Node	262	Above	80.00	;;Well No. C-10
Link	2056	Open	If Node	2300	Below	50.00	;;Well No. C-11
Link	2056	Closed	If Node	2300	Above	75.00	;;Well No. C-11
Link	2034	Open	If Node	798	Below	42.00	;;Well No. C-15
Link	2034	Closed	If Node	798	Above	87.00	;;Well No. C-15
Link	2004	Open	If Node	234	Below	35.00	;;Well No. C-16
Link	2004	Closed	If Node	234	Above	80.00	;;Well No. C-16
Link	2032	Open	If Node	672	Below	50.00	;;Well No. C-17
Link	2032	Closed	If Node	672	Above	98.00	;;Well No. C-17
Link	2002	Open	If Node	216	Below	50.00	;;Well No. C-18
Link	2002	Closed	If Node	216	Above	75.00	;;Well No. C-18
Link	2042	Open	If Node	874	Below	45.00	;;Well No. C-19
Link	2042	Closed	If Node	874	Above	95.00	;;Well No. C-19
Link	2030	Open	If Node	638	Below	41.00	;;Well No. C-20
Link	2030	Closed	If Node	638	Above	95.00	;;Well No. C-20
Link	2060	Open	If Node	2364	Below	45.00	;;Well No. C-22
Link	2060	Closed	If Node	2364	Above	87.00	;;Well No. C-22
Link	2040	Open	If Node	844	Below	40.00	;;Well No. C-23
Link	2040	Closed	If Node	844	Above	78.00	;;Well No. C-23
Link	2026	Open	If Node	578	Below	36.00	;;Well No. C-24
Link	2026	Closed	If Node	578	Above	75.00	;;Well No. C-24
Link	2036	Open	If Node	714	Below	45.00	;;Well No. C-25
Link	2036	Closed	If Node	714	Above	87.00	;;Well No. C-25
Link	2018	Open	If Node	486	Below	45.00	;;Well No. L-1
Link	2018	Closed	If Node	486	Above	75.00	;;Well No. L-1


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Link 2020 Open If Node 486 Below 45.00 ;;Well No. L-2
Link 2020 Closed If Node 486 Above 75.00 ;;Well No. L-2
Link 2062 Open If Node 530 Below 45.00 ;;Well No. L-5
Link 2062 Closed If Node 530 Above 75.00 ;;Well No. L-5
Link 2016 Open If Node 506 Below 45.00 ;;Well No. L-7
Link 2016 Closed If Node 506 Above 75.00 ;;Well No. L-7
Link 2028 Open If Node 598 Below 45.00 ;;Well No. R-7
Link 2028 Closed If Node 598 Above 75.00 ;;Well No. R-7

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;; Special Controls / Scenario of Peak Hour Condition
;; Link 3038 is a PRV that operates when Link 2014 (Booster) is closed
Link 3038 Closed At Time 0 ;; PRV-17 From 3MG E. Port. Tank
;; Link 2014 is a Booster Pump that operates OFF PEAK (10pm and 6am)
Link 2014 Closed At Time 0 ;; Booster to 3 MG E. Port. Tank
;; Link 2010 is a Booster Pump that operates OFF PEAK (9 am to 11:30 am)
Link 2010 Closed At Time 0 ;; Booster to 3MG Scenic Heights Tank
;;Link 2012 Closed At Time 0 ;; Booster to 50K Scenic Heights Tank
Link 2012 Open If Node 1000 Below 20.00 ;;To 50K Scenic Heights
Link 2012 Closed If Node 1000 Above 25.00 ;;To 50K Scenic Heights

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[SOURCES]
;;ID Conc Pattern Description

[DEMANDS]
;;ID Demand Pptrn Description

[PATTERNS]
;;PptrnID Factor0 Factor1 Factor2 Factor3 Factor4 Factor5
Description
; STS Average Day, Maximum Day, Peak Hour (activate ONLY ONE)
;1 1.0 ; STS - Average Day
;1 2.2 ; STS - Maximum Day
1 3.4 ; STS - Peak Hour
; EPS Average Day
2 0.60 0.50 0.70 0.80 1.10 1.70 ;;EPS - Average Day
2 1.40 1.30 1.20 1.00 0.90 1.00 ;;EPS - Average Day
2 0.90 0.90 1.00 1.10 1.30 1.20 ;;EPS - Average Day
2 1.10 1.00 0.90 0.95 0.80 0.70 ;;EPS - Average Day
; EPS Maximum Day
3 0.60 1.80 2.70 1.60 1.60 2.00 ;;EPS - Maximum Day
3 2.70 2.90 2.20 2.00 1.60 2.00 ;;EPS - Maximum Day
3 2.00 2.20 2.20 2.20 2.50 3.10 ;;EPS - Maximum Day
3 3.40 2.70 2.70 2.00 1.80 1.80 ;;EPS - Maximum Day
99 1.0 ; Fire Flows Not Peaked

```

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[ROUGHNESS]
;;StartID EndID Factor Description

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[STATUS]
;;ID Setting Description

```

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[QUALITY]
;;StartID EndID Quality Description

```

```

[REACTIONS]
;;Method StartID EndID Quality Description

```


[OPTIONS]
map Pv1998.map

[REPORT]
STATUS FULL

[TIMES]
;Duration 24.00 Hours
;Hydraulic Timestep 1.00 Hours
;Minimum TravelTime 0.10 Hours
;Pattern Timestep 1.00 Hours
;Report Timestep 1.00 Hours
;Report Start 0.00 Hours

[END]

[TANKS]
;;ID Pat/Curve Elev InitLvl MinLvl MaxLvl Diam MinVol
Zone Description

[Curves]
;;Curve_ID X-Values Y-Values
;;Eff.Curve Flow Percent Eff
;;Tank Geom. Volumn Level

[END]

H2ONET Customized Pipe Report - 1998 Peak Hour Demand

	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
1	1207	958	950	AC	14.00	582.09	457.49	0.95
2	1805	2402	2404	AC	12.00	723.65	166.82	0.47
3	1	2	4	PVC	12.00	640.40	0.00	0.00
4	3	4	6	PVC	12.00	179.68	0.00	0.00
5	5	6	8	PVC	12.00	111.77	0.00	0.00
6	7	8	10	PVC	12.00	1,389.11	-7.14	0.02
7	9	10	12	PVC	12.00	752.64	-7.14	0.02
8	11	12	14	PVC	12.00	1,214.39	0.00	0.00
9	13	12	16	PVC	12.00	1,416.42	738.46	2.09
10	15	16	18	PVC	12.00	1,318.43	588.52	1.67
11	17	18	20	PVC	12.00	1,327.91	445.72	1.26
12	19	20	22	PVC	12.00	1,522.41	75.82	0.22
13	21	20	24	PVC	12.00	1,292.72	288.99	0.82
14	23	24	26	PVC	12.00	502.88	240.37	0.68
15	25	26	28	PVC	12.00	275.38	240.37	0.68
16	27	28	30	PVC	12.00	530.84	169.17	0.48
17	153	148	150	PVC	12.00	1,655.24	-76.75	0.22
18	155	150	152	PVC	8.00	1,295.15	116.02	0.74
19	157	152	154	PVC	8.00	1,311.89	-76.75	0.49
20	159	154	148	PVC	8.00	1,239.91	-76.75	0.49
21	161	150	158	PVC	12.00	968.67	-192.78	0.55
22	231	162	160	PVC	10.00	886.67	0.00	0.00
23	233	218	160	PVC	12.00	2,564.02	198.22	0.56
24	259	240	242	PVC	16.00	39.68	142.71	0.23
25	263	244	242	PVC	16.00	1,541.09	148.33	0.24
26	333	286	282	PVC	16.00	869.21	935.97	1.49
27	335	282	272	PVC	16.00	1,340.72	671.29	1.07
28	343	272	244	PVC	16.00	1,062.56	671.29	1.07
29	363	286	128	PVC	16.00	1,294.83	-1,299.24	2.07
30	369	128	318	PVC	16.00	738.12	-1,945.51	3.10
31	371	318	316	PVC	16.00	272.79	-1,945.51	3.10
32	393	340	332	PVC	16.00	122.37	-1,010.58	1.61
33	395	332	338	PVC	16.00	68.27	-1,010.58	1.61
34	403	332	348	PVC	16.00	69.99	0.00	0.00
35	409	316	138	PVC	16.00	603.99	-1,945.51	3.10
36	415	138	356	PVC	16.00	473.98	-957.20	1.53
37	421	356	352	PVC	16.00	340.18	-957.20	1.53
38	429	352	340	PVC	16.00	1,811.04	-957.20	1.53

H2ONET Customized Pipe Report - 1998 Peak Hour Demand

	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
39	431	346	366	PVC	16.00	2,511.09	-858.70	1.37
40	433	366	368	PVC	16.00	233.12	-1,146.34	1.83
41	435	368	370	PVC	16.00	1,276.71	-1,146.34	1.83
42	437	370	376	PVC	16.00	126.54	-1,273.50	2.03
43	439	376	378	PVC	16.00	336.26	-1,273.50	2.03
44	441	378	374	PVC	16.00	1,013.74	4,287.22	6.84
45	443	1012	378	PVC	16.00	349.98	5,560.72	8.87
46	445	374	380	PVC	16.00	1,216.91	4,287.22	6.84
47	471	402	404	PVC	8.00	189.11	0.00	0.00
48	473	404	406	PVC	8.00	223.82	0.00	0.00
49	475	392	408	PVC	12.00	330.37	-26.09	0.07
50	477	408	402	PVC	12.00	648.43	-48.46	0.14
51	513	434	402	PVC	12.00	524.55	235.45	0.67
52	517	400	436	PVC	12.00	285.86	54.09	0.15
53	523	392	442	PVC	12.00	675.93	-136.21	0.39
54	525	158	442	PVC	12.00	474.42	118.00	0.33
55	679	550	554	PVC	12.00	323.31	406.97	1.15
56	703	434	554	PVC	12.00	1,463.34	-502.91	1.43
57	709	576	578	PVC	12.00	720.09	-1,138.97	3.23
58	711	582	584	PVC	8.00	171.73	-198.35	1.27
59	713	576	550	PVC	12.00	943.19	747.49	2.12
60	715	584	578	PVC	12.00	611.51	-141.73	0.40
61	717	576	586	PVC	10.00	1,041.33	355.98	1.45
62	719	586	588	PVC	10.00	321.25	0.00	0.00
63	721	590	586	PVC	8.00	745.64	0.00	0.00
64	725	582	592	PVC	8.00	537.07	-197.04	1.26
65	727	592	594	PVC	8.00	300.53	-197.04	1.26
66	743	610	608	PVC	12.00	343.46	0.00	0.00
67	773	628	226	PVC	12.00	395.11	596.98	1.69
68	775	628	636	PVC	12.00	209.42	-561.38	1.59
69	777	636	216	PVC	12.00	793.11	-561.38	1.59
70	811	656	660	PVC	8.00	1,342.90	-223.89	1.43
71	865	614	696	PVC	12.00	778.02	562.15	1.59
72	867	696	694	PVC	12.00	329.46	297.55	0.84
73	869	694	698	PVC	12.00	329.55	223.18	0.63
74	871	698	704	PVC	12.00	1,061.31	178.15	0.51
75	873	704	714	PVC	12.00	292.29	-35.07	0.10
76	875	614	682	PVC	12.00	1,327.75	565.00	1.60

H2ONET Customized Pipe Report - 1998 Peak Hour Demand

	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
77	877	682	668	PVC	12.00	502.84	264.78	0.75
78	879	668	678	PVC	12.00	652.02	1,328.24	3.77
79	881	678	680	PVC	12.00	126.28	1,523.59	4.32
80	887	584	600	PVC	12.00	1,324.55	-56.63	0.16
81	889	722	724	PVC	14.00	677.53	-793.31	1.65
82	891	724	726	PVC	14.00	640.92	-793.31	1.65
83	893	640	722	PVC	14.00	113.61	-793.31	1.65
84	895	2364	614	PVC	14.00	1,305.71	1,368.23	2.85
85	1041	826	748	PVC	12.00	1,334.91	-297.41	0.84
86	1049	840	838	PVC	12.00	2,289.69	-1,180.85	3.35
87	1051	838	836	PVC	12.00	1,021.88	-1,180.85	3.35
88	1053	836	834	PVC	12.00	387.56	-1,180.85	3.35
89	1055	834	832	PVC	12.00	642.66	-1,180.85	3.35
90	1057	832	714	PVC	12.00	367.55	-1,180.85	3.35
91	1061	842	844	PVC	12.00	1,944.31	-115.39	0.33
92	1063	844	846	PVC	12.00	710.58	639.48	1.81
93	1067	846	854	PVC	12.00	346.54	639.48	1.81
94	1069	854	848	PVC	12.00	313.56	580.48	1.65
95	1095	872	870	PVC	8.00	947.46	0.00	0.00
96	1097	870	868	PVC	8.00	2,680.83	-14.09	0.09
97	1099	860	874	PVC	12.00	664.34	432.08	1.23
98	1101	874	868	PVC	12.00	1,345.34	793.48	2.25
99	1103	876	878	PVC	10.00	454.99	66.86	0.27
100	1105	878	880	PVC	10.00	308.99	-53.35	0.22
101	1107	880	2418	PVC	10.00	470.18	-63.36	0.26
102	1111	876	868	PVC	12.00	1,395.58	-363.94	1.03
103	1113	868	890	PVC	10.00	1,733.90	374.99	1.53
104	1115	890	892	PVC	10.00	378.97	374.99	1.53
105	1117	892	894	PVC	10.00	873.32	-245.81	1.00
106	1119	894	896	PVC	10.00	321.70	-245.81	1.00
107	1121	896	888	PVC	10.00	230.68	-245.81	1.00
108	1123	888	886	PVC	12.00	859.78	-474.29	1.35
109	1125	886	876	PVC	12.00	582.86	-474.29	1.35
110	1127	904	902	PVC	12.00	1,372.68	741.72	2.10
111	1129	902	900	PVC	12.00	276.99	741.72	2.10
112	1131	900	898	PVC	12.00	256.90	-349.82	0.99
113	1133	898	892	PVC	12.00	701.14	-349.82	0.99
114	1135	912	2438	PVC	12.00	586.37	-520.03	1.48

H2ONET Customized Pipe Report - 1998 Peak Hour Demand

	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
115	1137	910	908	PVC	12.00	623.82	-656.65	1.86
116	1139	908	906	PVC	12.00	322.25	-830.42	2.36
117	1141	906	900	PVC	12.00	430.52	-1,091.54	3.10
118	1143	914	908	PVC	8.00	1,732.42	-173.77	1.11
119	1357	2056	2054	PVC	10.00	1,316.16	699.63	2.86
120	1359	2060	2056	PVC	10.00	425.74	699.63	2.86
121	1367	2068	2066	PVC	12.00	1,311.86	873.37	2.48
122	1369	2066	2058	PVC	10.00	661.31	699.63	2.86
123	1371	2070	2068	PVC	8.00	551.77	0.00	0.00
124	1377	2072	2068	PVC	12.00	763.78	873.37	2.48
125	1381	2080	870	PVC	12.00	1,335.64	133.47	0.38
126	1407	2100	2102	PVC	12.00	560.92	3,264.87	9.26
127	1409	2100	2104	PVC	12.00	805.39	-4,248.46	12.05
128	1411	2104	380	PVC	16.00	1,300.01	-4,248.46	6.78
129	1413	2106	2102	PVC	12.00	1,323.58	-3,186.68	9.04
130	1415	2106	2120	PVC	12.00	905.95	1,366.58	3.88
131	1417	2120	2118	PVC	12.00	407.52	1,366.58	3.88
132	1419	2118	2116	PVC	12.00	444.22	1,366.58	3.88
133	1425	2116	2126	PVC	12.00	155.58	1,366.58	3.88
134	1427	2126	2128	PVC	12.00	498.20	1,366.58	3.88
135	1429	2128	2130	PVC	12.00	461.76	1,366.58	3.88
136	1431	2130	2112	PVC	12.00	253.73	1,250.98	3.55
137	1433	2112	2110	PVC	10.00	516.64	1,061.42	4.34
138	1435	2110	2108	PVC	12.00	660.50	502.77	1.43
139	1437	2108	2076	PVC	12.00	513.89	692.33	1.96
140	1439	2114	2108	PVC	6.00	498.20	189.56	2.15
141	1441	2114	2112	PVC	6.00	678.59	-189.56	2.15
142	1445	2136	2106	PVC	12.00	1,317.07	-246.84	0.70
143	1447	2148	2146	PVC	10.00	1,168.65	0.00	0.00
144	1449	2140	2138	PVC	12.00	1,429.44	-246.84	0.70
145	1451	2138	2136	PVC	12.00	1,325.30	-246.84	0.70
146	1453	2140	2142	PVC	12.00	73.03	0.00	0.00
147	1455	2142	2144	PVC	12.00	80.94	0.00	0.00
148	1457	2160	2158	PVC	12.00	697.72	1,266.59	3.59
149	1459	2158	2156	PVC	12.00	307.61	1,266.59	3.59
150	1461	2156	2150	PVC	12.00	1,920.36	1,266.59	3.59
151	1463	2160	2106	PVC	12.00	1,291.81	-1,573.27	4.46
152	1465	2150	2162	PVC	12.00	588.11	-558.65	1.58

H2ONET Customized Pipe Report - 1998 Peak Hour Demand

	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
153	1467	2162	2164	PVC	12.00	188.93	-558.65	1.58
154	1469	2164	2110	PVC	12.00	1,018.06	-558.65	1.58
155	1473	2166	2170	PVC	8.00	389.02	33.66	0.21
156	1475	2166	2168	PVC	8.00	560.99	48.62	0.31
157	1477	2160	2186	PVC	8.00	1,337.92	306.68	1.96
158	1479	2186	2166	PVC	8.00	1,330.69	306.68	1.96
159	1481	2166	2182	PVC	8.00	1,345.17	224.40	1.43
160	1483	2182	2184	PVC	8.00	1,323.00	224.40	1.43
161	1485	2184	2180	PVC	8.00	182.07	224.40	1.43
162	1487	2180	2172	PVC	8.00	797.18	224.40	1.43
163	1489	2172	2174	PVC	8.00	1,266.59	224.40	1.43
164	1491	2174	2176	PVC	8.00	326.22	0.00	0.00
165	1493	2176	2178	PVC	8.00	434.79	0.00	0.00
166	1557	2228	2230	PVC	8.00	262.52	421.01	2.69
167	1559	2230	2220	PVC	8.00	869.64	154.30	0.98
168	1565	2216	2250	PVC	8.00	688.67	-165.69	1.06
169	1569	2250	2224	PVC	8.00	426.42	13.76	0.09
170	1571	2230	2232	PVC	8.00	435.17	87.25	0.56
171	1645	2232	2294	PVC	8.00	1,431.11	122.32	0.78
172	1647	2224	2296	PVC	8.00	1,450.26	-49.27	0.31
173	1699	2308	2018	PVC	8.00	293.78	59.15	0.38
174	1739	726	2364	PVC	14.00	456.97	-796.73	1.66
175	1839	2438	910	PVC	12.00	229.29	-656.65	1.86
176	29	28	46	AC	6.00	845.07	71.19	0.81
177	31	46	32	AC	6.00	537.03	71.19	0.81
178	33	30	32	AC	12.00	844.36	562.27	1.60
179	35	32	40	AC	12.00	446.62	475.85	1.35
180	37	40	42	AC	12.00	654.73	427.97	1.21
181	43	32	34	AC	6.00	483.13	-58.30	0.66
182	45	34	36	AC	6.00	483.73	-58.30	0.66
183	47	36	38	AC	6.00	827.65	-58.30	0.66
184	49	30	50	AC	12.00	1,330.37	-393.09	1.12
185	51	50	52	AC	6.00	749.36	74.56	0.85
186	53	52	38	AC	6.00	550.20	54.73	0.62
187	55	42	54	AC	12.00	458.69	440.55	1.25
188	57	54	44	AC	12.00	177.21	564.06	1.60
189	59	38	60	AC	6.00	450.70	-3.57	0.04
190	61	60	56	AC	6.00	277.77	88.20	1.00

H2ONET Customized Pipe Report - 1998 Peak Hour Demand

	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
191	63	56	58	AC	6.00	619.72	88.20	1.00
192	65	58	54	AC	6.00	1,006.37	88.20	1.00
193	67	44	62	AC	8.00	855.76	0.00	0.00
194	69	44	64	AC	12.00	299.48	0.00	0.00
195	71	12	66	AC	12.00	868.58	-821.42	2.33
196	73	66	68	AC	12.00	1,777.54	-821.42	2.33
197	75	68	70	AC	12.00	314.35	98.15	0.28
198	77	70	72	AC	10.00	478.14	98.15	0.40
199	79	68	74	AC	12.00	1,282.37	-919.58	2.61
200	81	74	76	AC	6.00	815.13	54.88	0.62
201	83	72	76	AC	6.00	1,282.27	-141.55	1.61
202	85	72	78	AC	10.00	348.13	0.00	0.00
203	87	78	80	AC	10.00	1,233.04	0.00	0.00
204	89	80	82	AC	6.00	405.01	0.00	0.00
205	91	86	84	AC	6.00	1,276.67	-18.59	0.21
206	93	84	88	AC	6.00	464.50	0.00	0.00
207	95	88	90	AC	8.00	236.44	0.00	0.00
208	97	90	92	AC	8.00	619.21	0.00	0.00
209	99	84	94	AC	6.00	713.87	-18.59	0.21
210	101	94	96	AC	6.00	100.29	-70.27	0.80
211	103	96	98	AC	6.00	91.07	-157.99	1.79
212	105	98	100	AC	6.00	538.84	-228.71	2.60
213	109	104	106	AC	10.00	705.26	2,140.12	8.74
214	111	106	108	AC	10.00	628.43	1,509.30	6.17
215	121	102	118	AC	12.00	488.39	0.00	0.00
216	123	118	122	AC	12.00	526.51	0.00	0.00
217	127	124	120	AC	12.00	561.68	-543.13	1.54
218	131	130	128	AC	12.00	536.70	-543.13	1.54
219	133	106	132	AC	6.00	558.16	477.48	5.42
220	135	132	134	AC	6.00	362.89	477.48	5.42
221	137	134	136	AC	6.00	680.48	477.48	5.42
222	139	108	138	AC	8.00	1,308.86	1,180.75	7.54
223	141	116	104	AC	10.00	131.26	2,910.66	11.89
224	143	108	140	AC	10.00	448.71	1,099.10	4.49
225	145	140	142	AC	8.00	259.60	-205.72	1.31
226	149	144	146	AC	8.00	1,264.62	0.00	0.00
227	151	156	148	AC	8.00	441.38	0.00	0.00
228	163	184	186	AC	6.00	489.52	-94.09	1.07

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	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
229	165	186	174	AC	6.00	332.91	-94.09	1.07
230	167	174	172	AC	6.00	721.31	-212.37	2.41
231	169	174	176	AC	6.00	811.56	118.28	1.34
232	171	176	178	AC	6.00	222.13	118.28	1.34
233	173	178	182	AC	6.00	268.18	-108.34	1.23
234	175	182	184	AC	6.00	314.17	-108.34	1.23
235	177	178	180	AC	6.00	231.09	226.63	2.57
236	179	180	50	AC	8.00	414.70	226.63	1.45
237	181	50	188	AC	8.00	575.89	-439.25	2.80
238	183	188	184	AC	6.00	110.97	14.25	0.16
239	185	188	190	AC	8.00	748.19	-453.50	2.89
240	187	190	194	AC	6.00	638.15	-189.31	2.15
241	189	194	192	AC	6.00	277.58	-21.25	0.24
242	191	192	170	AC	6.00	240.61	144.17	1.64
243	193	172	170	AC	6.00	249.38	-212.37	2.41
244	195	170	168	AC	6.00	323.66	-68.20	0.77
245	197	168	166	AC	8.00	1,146.69	0.00	0.00
246	199	166	164	AC	8.00	286.32	0.00	0.00
247	201	190	200	AC	8.00	1,283.83	-613.43	3.92
248	203	200	198	AC	12.00	675.07	55.49	0.16
249	205	198	196	AC	12.00	795.50	-277.99	0.79
250	207	198	210	AC	6.00	258.78	333.48	3.78
251	209	210	208	AC	6.00	508.61	167.06	1.90
252	211	208	206	AC	6.00	480.28	167.06	1.90
253	213	206	204	AC	6.00	259.59	167.06	1.90
254	215	204	192	AC	6.00	526.46	165.43	1.88
255	217	204	202	AC	6.00	268.18	1.63	0.02
256	219	202	194	AC	6.00	517.31	168.06	1.91
257	221	168	196	AC	6.00	1,311.57	-255.88	2.90
258	223	202	212	AC	6.00	379.15	-166.43	1.89
259	225	212	214	AC	6.00	489.60	-166.43	1.89
260	227	214	210	AC	6.00	388.51	-166.43	1.89
261	229	196	216	AC	12.00	380.06	-533.87	1.51
262	235	224	220	AC	12.00	1,212.28	542.89	1.54
263	237	220	158	AC	12.00	721.75	310.78	0.88
264	239	52	232	AC	6.00	546.75	-152.21	1.73
265	241	232	230	AC	6.00	319.46	-152.21	1.73
266	243	230	228	AC	6.00	767.08	-152.21	1.73

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267	245	228	190	AC	6.00	1,127.88	-139.80	1.59
268	247	228	236	AC	6.00	1,528.45	-12.41	0.14
269	249	236	238	AC	8.00	1,345.05	333.00	2.13
270	251	238	60	AC	6.00	816.85	91.77	1.04
271	253	236	240	AC	8.00	1,276.02	-653.96	4.17
272	255	240	234	AC	12.00	1,832.62	-470.92	1.34
273	257	234	200	AC	12.00	839.02	211.40	0.60
274	261	246	2362	AC	12.00	638.07	54.59	0.15
275	265	238	258	AC	6.00	997.89	-91.97	1.04
276	267	258	256	AC	6.00	314.15	-91.97	1.04
277	269	256	254	AC	6.00	140.75	-91.97	1.04
278	271	254	252	AC	6.00	709.39	-91.97	1.04
279	273	252	250	AC	6.00	160.07	-91.97	1.04
280	275	250	248	AC	6.00	294.00	-91.97	1.04
281	277	248	236	AC	6.00	964.87	-91.97	1.04
282	279	264	262	AC	12.00	1,042.85	-160.68	0.46
283	281	262	260	AC	12.00	83.42	520.58	1.48
284	283	260	74	AC	12.00	1,341.98	974.46	2.76
285	285	266	264	AC	8.00	1,323.09	-337.44	2.15
286	287	266	76	AC	6.00	322.84	86.67	0.98
287	289	260	244	AC	12.00	1,263.33	-453.87	1.29
288	291	244	246	AC	12.00	58.79	69.09	0.20
289	295	268	264	AC	8.00	1,301.14	150.39	0.96
290	297	246	270	AC	8.00	507.26	41.32	0.26
291	299	270	268	AC	8.00	570.17	41.32	0.26
292	301	122	274	AC	12.00	363.51	0.00	0.00
293	303	274	278	AC	12.00	234.27	0.00	0.00
294	305	278	280	AC	12.00	97.53	0.00	0.00
295	307	130	276	AC	12.00	78.84	0.00	0.00
296	309	120	130	AC	12.00	279.47	-543.13	1.54
297	311	300	298	AC	6.00	714.16	-84.73	0.96
298	313	298	296	AC	6.00	175.36	-41.55	0.47
299	315	296	294	AC	6.00	238.11	-41.55	0.47
300	317	294	292	AC	6.00	203.74	-41.55	0.47
301	319	292	290	AC	6.00	308.09	-12.22	0.14
302	321	298	304	AC	6.00	630.95	-43.18	0.49
303	323	304	302	AC	6.00	255.49	-43.18	0.49
304	325	302	292	AC	6.00	638.15	29.32	0.33

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305	327	302	284	AC	6.00	316.95	-72.51	0.82
306	329	284	282	AC	8.00	63.39	-264.68	1.69
307	331	286	288	AC	8.00	56.00	136.01	0.87
308	337	288	284	AC	8.00	876.36	136.01	0.87
309	339	284	290	AC	8.00	665.99	121.30	0.77
310	341	290	268	AC	8.00	652.86	109.08	0.70
311	345	264	300	AC	12.00	664.87	-338.83	0.96
312	347	300	306	AC	12.00	277.76	-254.10	0.72
313	349	306	308	AC	12.00	648.48	-254.10	0.72
314	351	308	310	AC	12.00	618.14	-419.14	1.19
315	353	310	312	AC	12.00	339.46	-337.48	0.96
316	355	312	124	AC	12.00	610.92	-543.13	1.54
317	357	310	286	AC	6.00	1,187.51	-81.66	0.93
318	359	312	314	AC	6.00	1,189.45	-9.91	0.11
319	373	314	286	AC	6.00	344.19	-145.60	1.65
320	375	266	320	AC	6.00	1,591.05	-34.14	0.39
321	377	320	308	AC	6.00	1,294.09	-165.04	1.87
322	385	100	322	AC	6.00	208.25	-228.71	2.60
323	387	142	326	AC	8.00	1,184.65	-590.90	3.77
324	389	328	144	AC	8.00	623.07	-590.90	3.77
325	399	144	342	AC	8.00	1,258.35	-848.62	5.42
326	401	342	344	AC	8.00	162.22	-848.62	5.42
327	413	140	358	AC	10.00	1,312.86	1,304.82	5.33
328	417	142	360	AC	6.00	1,346.18	385.17	4.37
329	419	358	360	AC	10.00	357.02	1,304.82	5.33
330	423	338	364	AC	10.00	1,245.49	-822.78	3.36
331	425	364	362	AC	10.00	314.48	-870.96	3.56
332	427	362	360	AC	10.00	304.20	-1,591.35	6.50
333	447	220	222	AC	8.00	456.61	131.13	0.84
334	449	222	388	AC	8.00	686.73	73.28	0.47
335	451	388	390	AC	8.00	657.94	93.46	0.60
336	453	390	386	AC	8.00	251.73	-39.65	0.25
337	455	386	384	AC	6.00	96.63	-39.65	0.45
338	457	384	382	AC	6.00	779.84	-39.65	0.45
339	459	382	222	AC	6.00	380.45	-39.65	0.45
340	461	392	388	AC	6.00	715.99	20.18	0.23
341	463	226	396	AC	12.00	492.90	54.09	0.15
342	465	396	398	AC	12.00	586.42	54.09	0.15

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343	467	398	400	AC	12.00	437.90	54.09	0.15
344	479	410	412	AC	6.00	455.45	-24.49	0.28
345	481	412	408	AC	6.00	937.09	-22.37	0.25
346	483	410	390	AC	6.00	316.51	50.16	0.57
347	485	410	414	AC	6.00	382.86	-25.67	0.29
348	487	414	416	AC	6.00	439.75	-6.86	0.08
349	489	416	412	AC	6.00	382.75	2.12	0.02
350	491	414	418	AC	6.00	277.17	-18.81	0.21
351	493	418	420	AC	6.00	267.04	19.96	0.23
352	495	420	426	AC	6.00	512.43	19.96	0.23
353	497	418	422	AC	6.00	230.34	-38.77	0.44
354	499	422	424	AC	6.00	512.43	-38.77	0.44
355	501	416	428	AC	6.00	146.50	-8.98	0.10
356	503	428	430	AC	6.00	429.31	-16.84	0.19
357	505	430	432	AC	6.00	643.14	-16.84	0.19
358	509	426	424	AC	8.00	497.36	-118.69	0.76
359	511	432	434	AC	8.00	486.86	-80.45	0.51
360	519	438	440	AC	6.00	486.14	54.09	0.61
361	521	222	442	AC	6.00	708.83	18.21	0.21
362	527	426	444	AC	8.00	196.07	-71.47	0.46
363	529	444	432	AC	8.00	427.04	-63.61	0.41
364	531	428	444	AC	6.00	641.51	7.86	0.09
365	533	424	446	AC	6.00	141.24	-157.46	1.79
366	535	446	448	AC	6.00	905.75	-82.48	0.94
367	537	440	448	AC	6.00	867.33	-14.62	0.17
368	539	440	450	AC	6.00	278.86	-103.33	1.17
369	541	450	452	AC	6.00	683.75	-103.33	1.17
370	543	452	460	AC	6.00	532.45	-103.33	1.17
371	545	460	466	AC	6.00	312.54	34.29	0.39
372	547	460	462	AC	6.00	417.22	-137.62	1.56
373	549	462	464	AC	6.00	308.66	82.57	0.94
374	551	448	468	AC	6.00	318.32	-47.41	0.54
375	553	468	466	AC	6.00	645.28	-154.36	1.75
376	555	466	464	AC	6.00	413.34	-120.07	1.36
377	557	462	470	AC	6.00	231.97	-220.20	2.50
378	559	470	472	AC	6.00	389.80	-220.20	2.50
379	561	472	474	AC	6.00	659.03	-220.20	2.50
380	563	474	476	AC	6.00	718.04	-220.20	2.50

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381	565	476	478	AC	4.00	335.01	201.43	5.14
382	567	478	464	AC	6.00	578.19	11.62	0.13
383	569	476	480	AC	4.00	292.13	-118.29	3.02
384	571	476	482	AC	6.00	676.52	-303.33	3.44
385	575	484	482	AC	6.00	297.50	373.74	4.24
386	577	480	498	AC	4.00	477.78	-118.29	3.02
387	579	498	494	AC	4.00	664.12	-118.29	3.02
388	581	494	492	AC	4.00	646.63	-63.95	1.63
389	583	492	490	AC	4.00	481.21	158.34	4.04
390	585	490	488	AC	4.00	297.50	161.76	4.13
391	587	488	482	AC	4.00	655.43	-70.41	1.80
392	589	496	486	AC	6.00	651.23	85.58	0.97
393	591	486	494	AC	6.00	704.35	678.66	7.70
394	593	494	484	AC	6.00	472.47	373.74	4.24
395	595	496	492	AC	4.00	721.80	222.29	5.68
396	597	506	508	AC	6.00	240.34	178.76	2.03
397	599	508	502	AC	6.00	463.78	178.76	2.03
398	601	504	502	AC	6.00	235.93	178.75	2.03
399	603	506	504	AC	6.00	468.25	178.75	2.03
400	605	502	500	AC	6.00	371.40	307.87	3.49
401	607	500	496	AC	6.00	1,963.06	307.87	3.49
402	609	464	510	AC	6.00	1,343.31	-25.88	0.29
403	611	510	512	AC	6.00	581.82	-58.85	0.67
404	613	512	478	AC	4.00	1,324.08	15.90	0.41
405	615	512	488	AC	4.00	330.25	-232.16	5.93
406	617	510	514	AC	6.00	232.01	32.97	0.37
407	623	514	516	AC	6.00	835.57	146.73	1.67
408	625	516	518	AC	6.00	991.94	58.08	0.66
409	627	518	468	AC	6.00	334.84	31.42	0.36
410	629	518	520	AC	6.00	157.48	26.66	0.30
411	635	520	524	AC	6.00	170.66	26.66	0.30
412	637	524	448	AC	6.00	331.40	49.70	0.56
413	639	516	536	AC	6.00	319.24	88.65	1.01
414	641	514	526	AC	6.00	304.22	-113.76	1.29
415	643	526	528	AC	6.00	329.30	-113.76	1.29
416	645	528	530	AC	6.00	262.15	-113.76	1.29
417	647	530	532	AC	6.00	408.52	150.43	1.71
418	649	532	534	AC	6.00	1,071.76	150.43	1.71

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419	651	534	536	AC	6.00	581.09	-29.24	0.33
420	655	446	538	AC	6.00	283.12	-74.97	0.85
421	657	536	540	AC	6.00	221.72	59.41	0.67
422	659	540	524	AC	6.00	777.43	23.04	0.26
423	661	538	542	AC	6.00	808.33	-74.97	0.85
424	663	542	540	AC	6.00	883.69	-36.37	0.41
425	665	542	546	AC	6.00	692.05	-38.60	0.44
426	667	546	544	AC	6.00	441.91	-18.98	0.22
427	669	544	534	AC	6.00	465.92	-18.98	0.22
428	671	546	548	AC	6.00	867.46	-19.62	0.22
429	673	554	552	AC	6.00	883.82	-60.43	0.69
430	675	552	548	AC	6.00	314.62	-60.43	0.69
431	677	548	550	AC	6.00	888.94	62.38	0.71
432	681	562	560	AC	6.00	328.57	0.00	0.00
433	683	562	564	AC	6.00	826.05	0.00	0.00
434	685	564	558	AC	6.00	317.60	0.00	0.00
435	687	558	560	AC	6.00	829.78	0.00	0.00
436	689	558	556	AC	6.00	299.74	0.00	0.00
437	691	556	566	AC	6.00	485.22	-187.00	2.12
438	693	566	434	AC	6.00	40.87	-187.00	2.12
439	695	574	570	AC	6.00	1,396.72	35.51	0.40
440	697	570	568	AC	6.00	639.73	0.00	0.00
441	699	570	572	AC	6.00	628.68	35.51	0.40
442	701	572	554	AC	6.00	154.13	35.51	0.40
443	705	548	580	AC	6.00	535.89	-142.43	1.62
444	707	580	582	AC	6.00	456.12	-142.43	1.62
445	723	574	576	AC	4.00	644.55	-35.51	0.91
446	731	594	598	AC	6.00	230.15	-197.04	2.24
447	735	598	602	AC	6.00	263.89	223.53	2.54
448	737	534	602	AC	6.00	572.43	-198.69	2.25
449	739	602	600	AC	6.00	219.65	24.85	0.28
450	745	608	604	AC	10.00	277.60	0.00	0.00
451	747	604	606	AC	10.00	626.03	-209.44	0.86
452	749	606	600	AC	10.00	1,074.50	-209.44	0.86
453	751	612	604	AC	10.00	505.63	0.00	0.00
454	755	616	600	AC	6.00	1,344.35	241.22	2.74
455	757	628	618	AC	6.00	418.35	-183.49	2.08
456	759	618	620	AC	6.00	917.92	-183.49	2.08

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457	761	620	622	AC	6.00	504.38	-183.49	2.08
458	763	622	624	AC	6.00	293.87	-183.49	2.08
459	765	624	630	AC	6.00	283.24	-183.49	2.08
460	767	630	626	AC	6.00	1,193.89	-23.14	0.26
461	769	630	632	AC	6.00	525.69	-160.35	1.82
462	771	632	634	AC	6.00	1,182.59	-160.35	1.82
463	779	634	638	AC	8.00	631.99	-946.33	6.04
464	781	638	640	AC	8.00	480.62	638.31	4.07
465	783	634	642	AC	8.00	174.92	645.56	4.12
466	785	642	626	AC	8.00	342.08	645.56	4.12
467	787	626	200	AC	8.00	1,020.98	622.42	3.97
468	789	644	646	AC	8.00	1,302.35	-488.00	3.11
469	791	644	240	AC	10.00	1,329.97	271.16	1.11
470	793	652	650	AC	8.00	596.21	181.97	1.16
471	795	650	648	AC	6.00	698.18	181.97	2.06
472	797	648	644	AC	6.00	628.31	181.97	2.06
473	799	646	652	AC	12.00	651.92	995.05	2.82
474	801	652	654	AC	12.00	802.72	570.31	1.62
475	803	646	658	AC	12.00	344.15	-1,483.05	4.21
476	805	658	656	AC	12.00	337.81	-1,333.53	3.78
477	807	656	640	AC	12.00	1,884.89	-1,431.61	4.06
478	809	658	662	AC	6.00	1,350.84	-149.52	1.70
479	813	660	664	AC	6.00	172.78	-223.89	2.54
480	815	664	662	AC	6.00	149.22	149.52	1.70
481	817	664	666	AC	6.00	613.44	-373.42	4.24
482	819	666	672	AC	8.00	204.42	-568.77	3.63
483	821	672	670	AC	10.00	149.43	1,063.45	4.34
484	823	670	668	AC	12.00	690.47	1,063.45	3.02
485	825	676	674	AC	6.00	369.21	0.00	0.00
486	827	674	666	AC	6.00	306.49	-195.35	2.22
487	829	674	678	AC	6.00	682.49	195.35	2.22
488	831	712	708	AC	6.00	474.83	33.78	0.38
489	833	708	710	AC	6.00	329.95	63.78	0.72
490	835	708	706	AC	6.00	525.56	-29.99	0.34
491	837	706	702	AC	6.00	691.14	-29.99	0.34
492	839	702	704	AC	6.00	290.70	-18.75	0.21
493	841	702	700	AC	6.00	1,045.62	-11.25	0.13
494	843	712	700	AC	6.00	638.08	-33.78	0.38

H2ONET Customized Pipe Report - 1998 Peak Hour Demand

	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
495	845	700	698	AC	6.00	290.70	-45.03	0.51
496	847	710	684	AC	6.00	849.52	63.78	0.72
497	849	684	694	AC	6.00	1,319.45	-74.37	0.84
498	851	686	696	AC	6.00	1,311.62	-96.98	1.10
499	853	686	688	AC	6.00	164.73	96.98	1.10
500	855	688	690	AC	6.00	816.84	96.98	1.10
501	857	690	692	AC	6.00	514.34	96.98	1.10
502	859	692	684	AC	6.00	1,007.68	-138.15	1.57
503	861	716	692	AC	6.00	289.41	4.24	0.05
504	863	716	680	AC	10.00	1,059.97	-4.24	0.02
505	883	718	680	AC	12.00	1,129.39	-1,167.79	3.31
506	885	720	718	AC	10.00	678.92	-1,167.79	4.77
507	897	728	616	AC	6.00	1,268.17	241.22	2.74
508	899	246	730	AC	12.00	1,332.26	-194.09	0.55
509	901	730	732	AC	12.00	1,151.34	-194.09	0.55
510	903	732	734	AC	10.00	268.73	-284.42	1.16
511	905	734	736	AC	10.00	67.67	-228.17	0.93
512	907	736	742	AC	6.00	1,025.31	-141.51	1.61
513	909	742	744	AC	6.00	302.17	-141.51	1.61
514	911	744	746	AC	6.00	168.29	-141.20	1.60
515	913	746	654	AC	6.00	603.87	-141.20	1.60
516	915	744	740	AC	6.00	1,016.87	0.00	0.00
517	917	736	738	AC	12.00	251.81	-86.66	0.25
518	919	740	748	AC	12.00	621.12	0.00	0.00
519	921	748	654	AC	12.00	1,185.46	-694.43	1.97
520	923	284	768	AC	8.00	222.74	-45.06	0.29
521	925	768	766	AC	8.00	251.95	-36.60	0.23
522	927	766	764	AC	8.00	285.51	-32.25	0.21
523	929	764	762	AC	8.00	554.04	-33.09	0.21
524	931	762	758	AC	8.00	352.53	-131.38	0.84
525	933	758	760	AC	8.00	394.50	-53.45	0.34
526	935	770	760	AC	8.00	579.22	163.53	1.04
527	937	758	750	AC	8.00	666.93	59.84	0.38
528	939	750	734	AC	8.00	664.12	56.25	0.36
529	941	750	752	AC	8.00	344.14	-44.45	0.28
530	943	752	738	AC	10.00	672.37	86.66	0.35
531	945	752	754	AC	10.00	67.15	-131.11	0.54
532	947	754	760	AC	10.00	664.12	-110.08	0.45

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533	949	754	756	AC	10.00	571.01	-324.65	1.33
534	951	780	768	AC	6.00	967.76	8.46	0.10
535	953	780	778	AC	6.00	243.41	-8.46	0.10
536	955	778	766	AC	6.00	958.97	4.35	0.05
537	957	778	776	AC	6.00	251.95	-12.81	0.15
538	959	776	772	AC	6.00	841.42	-11.97	0.14
539	961	772	774	AC	6.00	159.89	-8.15	0.09
540	963	774	750	AC	6.00	310.56	-48.04	0.55
541	965	762	772	AC	6.00	504.24	3.82	0.04
542	967	764	776	AC	6.00	958.08	0.84	0.01
543	969	774	782	AC	6.00	655.51	39.89	0.45
544	971	782	732	AC	6.00	61.11	39.89	0.45
545	973	786	784	AC	6.00	999.15	-74.77	0.85
546	975	784	762	AC	6.00	1,218.60	47.32	0.54
547	977	786	314	AC	8.00	376.67	74.77	0.48
548	979	758	790	AC	8.00	1,527.76	-137.77	0.88
549	981	784	788	AC	6.00	301.35	-122.09	1.39
550	983	788	790	AC	6.00	363.15	-45.19	0.51
551	985	790	792	AC	6.00	379.24	-35.89	0.41
552	987	792	794	AC	10.00	571.56	216.81	0.89
553	989	792	796	AC	10.00	713.60	-252.70	1.03
554	991	796	798	AC	12.00	591.73	-402.28	1.14
555	993	802	800	AC	12.00	356.36	-145.31	0.41
556	995	800	796	AC	12.00	383.31	-149.58	0.42
557	997	802	804	AC	12.00	40.39	-26.25	0.07
558	999	128	804	AC	12.00	1,328.04	103.15	0.29
559	1001	800	790	AC	8.00	713.61	147.07	0.94
560	1003	788	804	AC	6.00	679.94	-76.90	0.87
561	1005	806	810	AC	8.00	390.46	103.10	0.66
562	1007	810	800	AC	8.00	397.19	142.80	0.91
563	1009	810	812	AC	8.00	390.04	-39.70	0.25
564	1011	808	802	AC	6.00	774.21	83.44	0.95
565	1013	808	806	AC	6.00	349.90	81.30	0.92
566	1015	806	814	AC	6.00	390.04	-21.80	0.25
567	1017	814	816	AC	6.00	571.56	-21.80	0.25
568	1019	812	818	AC	6.00	578.28	-39.70	0.45
569	1025	816	820	AC	12.00	138.34	-202.66	0.57
570	1027	798	794	AC	10.00	713.88	406.44	1.66

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571	1029	794	822	AC	10.00	312.48	67.01	0.27
572	1031	822	770	AC	8.00	1,206.24	67.01	0.43
573	1033	770	756	AC	6.00	655.99	3.37	0.04
574	1035	756	748	AC	6.00	698.33	-178.77	2.03
575	1037	654	824	AC	12.00	1,347.87	-265.31	0.75
576	1039	826	824	AC	8.00	1,187.81	-280.68	1.79
577	1043	826	828	AC	8.00	636.15	0.00	0.00
578	1045	824	830	AC	12.00	661.00	-545.99	1.55
579	1047	830	720	AC	12.00	662.16	-545.99	1.55
580	1059	720	842	AC	10.00	846.95	621.80	2.54
581	1071	856	854	AC	6.00	1,960.78	-59.00	0.67
582	1073	850	848	AC	10.00	1,977.52	-227.07	0.93
583	1075	850	856	AC	10.00	354.79	-280.41	1.15
584	1077	856	852	AC	10.00	395.94	-385.97	1.58
585	1079	852	842	AC	10.00	660.10	-490.35	2.00
586	1081	848	858	AC	12.00	668.19	165.39	0.47
587	1083	858	862	AC	12.00	321.41	-510.77	1.45
588	1085	862	864	AC	6.00	626.90	126.19	1.43
589	1087	858	860	AC	12.00	635.20	676.16	1.92
590	1089	866	864	AC	8.00	1,647.89	-119.24	0.76
591	1091	864	860	AC	8.00	329.54	24.52	0.16
592	1155	932	936	AC	12.00	140.47	100.00	0.28
593	1167	928	952	AC	14.00	463.05	-124.84	0.26
594	1169	952	950	AC	14.00	972.28	-124.84	0.26
595	1179	950	948	AC	10.00	396.02	183.45	0.75
596	1181	944	942	AC	12.00	331.24	-98.08	0.28
597	1183	942	866	AC	12.00	333.81	-85.44	0.24
598	1185	944	946	AC	10.00	330.87	-258.62	1.06
599	1187	946	948	AC	10.00	478.49	-230.65	0.94
600	1193	928	926	AC	14.00	923.63	681.19	1.42
601	1195	926	924	AC	12.00	362.94	-178.83	0.51
602	1197	924	922	AC	12.00	355.07	-178.83	0.51
603	1199	922	920	AC	12.00	363.03	-178.83	0.51
604	1201	920	918	AC	12.00	346.54	-178.83	0.51
605	1203	918	874	AC	12.00	350.75	-577.99	1.64
606	1209	958	972	AC	14.00	1,065.20	227.18	0.47
607	1211	972	820	AC	14.00	1,263.17	-2.09	0.00
608	1213	958	960	AC	8.00	249.35	101.48	0.65

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609	1215	960	962	AC	8.00	387.77	101.48	0.65
610	1223	966	968	AC	8.00	972.46	116.31	0.74
611	1225	904	974	AC	12.00	218.21	-616.00	1.75
612	1227	974	926	AC	12.00	823.91	-616.00	1.75
613	1229	850	996	AC	10.00	465.83	430.82	1.76
614	1231	996	866	AC	6.00	830.00	17.59	0.20
615	1233	996	994	AC	10.00	700.47	123.21	0.50
616	1235	994	986	AC	10.00	584.94	127.54	0.52
617	1237	986	990	AC	10.00	487.30	127.54	0.52
618	1239	994	992	AC	10.00	346.54	-4.33	0.02
619	1241	998	850	AC	6.00	1,302.57	-76.66	0.87
620	1243	992	2002	AC	8.00	495.00	-4.33	0.03
621	1245	2002	984	AC	8.00	577.55	47.06	0.30
622	1247	2002	866	AC	8.00	721.77	-51.39	0.33
623	1249	2000	866	AC	8.00	704.87	0.00	0.00
624	1251	984	2004	AC	8.00	800.99	51.70	0.33
625	1253	2004	998	AC	8.00	560.95	51.70	0.33
626	1255	998	990	AC	10.00	54.97	114.86	0.47
627	1257	990	2006	AC	10.00	669.19	142.51	0.58
628	1259	2008	826	AC	8.00	649.77	-171.45	1.09
629	1261	2008	852	AC	8.00	1,299.00	-104.39	0.67
630	1263	2008	998	AC	8.00	651.68	275.84	1.76
631	1265	2006	756	AC	10.00	1,354.98	142.51	0.58
632	1267	990	770	AC	8.00	1,312.50	99.89	0.64
633	1269	984	982	AC	8.00	330.05	-4.65	0.03
634	1271	982	980	AC	8.00	321.70	1.28	0.01
635	1273	980	978	AC	8.00	395.94	6.53	0.04
636	1275	978	976	AC	8.00	407.20	33.92	0.22
637	1277	976	972	AC	8.00	371.19	-278.17	1.78
638	1287	798	2012	AC	12.00	159.17	-105.24	0.30
639	1289	2012	818	AC	12.00	238.59	-122.68	0.35
640	1291	818	2010	AC	12.00	155.95	-162.39	0.46
641	1293	2010	816	AC	12.00	234.90	-180.86	0.51
642	1299	2014	820	AC	12.00	399.08	160.84	0.46
643	1303	2020	2018	AC	8.00	1,262.10	-10.24	0.07
644	1305	2018	972	AC	8.00	414.36	48.91	0.31
645	1307	2020	820	AC	8.00	420.22	43.90	0.28
646	1313	2024	136	AC	6.00	123.24	-477.48	5.42

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647	1315	2024	2026	AC	6.00	174.03	477.48	5.42
648	1319	2030	2026	AC	6.00	1,125.77	-232.03	2.63
649	1321	2030	808	AC	6.00	440.14	164.73	1.87
650	1337	2040	138	AC	8.00	204.14	146.89	0.94
651	1341	2014	2044	AC	12.00	294.96	-160.84	0.46
652	1343	2044	2048	AC	12.00	172.11	-590.01	1.67
653	1345	2048	2046	AC	12.00	200.10	-590.01	1.67
654	1347	2046	2042	AC	12.00	317.23	-722.19	2.05
655	1349	2042	2050	AC	12.00	299.12	-684.47	1.94
656	1355	2050	362	AC	10.00	2,593.84	-720.39	2.94
657	1361	2054	338	AC	8.00	1,272.19	187.80	1.20
658	1363	2054	2062	AC	8.00	1,330.26	317.35	2.03
659	1365	2064	2054	AC	8.00	558.97	0.00	0.00
660	1373	2076	2074	AC	8.00	398.17	494.84	3.16
661	1375	2074	2072	AC	8.00	172.13	873.37	5.57
662	1379	2078	2062	AC	8.00	1,306.20	16.19	0.10
663	1383	2082	2076	AC	8.00	1,306.24	416.34	2.66
664	1385	2082	2084	AC	8.00	271.56	0.00	0.00
665	1387	2086	2092	AC	6.00	1,024.22	224.25	2.54
666	1389	2092	2094	AC	6.00	117.96	224.25	2.54
667	1391	2094	2090	AC	6.00	108.94	-177.74	2.02
668	1393	2090	2088	AC	6.00	1,005.50	-177.74	2.02
669	1395	2086	2088	AC	6.00	272.02	282.59	3.21
670	1397	2088	2082	AC	6.00	282.79	104.84	1.19
671	1399	2094	2074	AC	6.00	264.72	401.99	4.56
672	1401	2098	2086	AC	6.00	1,332.49	558.52	6.34
673	1403	2098	2096	AC	6.00	560.92	425.07	4.82
674	1405	2096	2082	AC	6.00	1,314.35	503.26	5.71
675	1421	2124	2122	AC	6.00	796.19	-51.68	0.59
676	1423	2122	2086	AC	6.00	788.88	-51.68	0.59
677	1443	2076	2134	AC	8.00	966.53	613.83	3.92
678	1495	2188	2152	AC	12.00	867.70	-1,565.66	4.44
679	1497	2188	2190	AC	12.00	1,259.11	1,538.46	4.36
680	1499	2190	2192	AC	12.00	1,177.60	1,307.24	3.71
681	1501	2154	2194	AC	6.00	934.86	259.58	2.95
682	1503	2194	2196	AC	6.00	371.52	259.58	2.95
683	1505	2196	2190	AC	6.00	678.77	259.58	2.95
684	1507	2192	2198	AC	10.00	362.78	450.08	1.84

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685	1509	2214	2212	AC	10.00	621.89	160.19	0.65
686	1511	2214	2216	AC	8.00	662.28	-255.39	1.63
687	1513	2212	2210	AC	10.00	450.94	156.79	0.64
688	1515	2210	2208	AC	10.00	217.59	156.79	0.64
689	1517	2208	2206	AC	8.00	190.85	-175.73	1.12
690	1519	2206	2204	AC	8.00	1,385.94	-59.85	0.38
691	1521	2204	2202	AC	10.00	960.94	148.29	0.61
692	1527	2240	2202	AC	12.00	987.40	-264.61	0.75
693	1529	2240	2200	AC	12.00	398.96	201.74	0.57
694	1531	2198	2200	AC	12.00	1,234.56	268.73	0.76
695	1533	2200	904	AC	12.00	1,009.27	240.29	0.68
696	1539	2202	968	AC	8.00	1,599.15	-116.31	0.74
697	1541	2204	2246	AC	10.00	54.38	-208.14	0.85
698	1549	2244	966	AC	8.00	995.30	-48.28	0.31
699	1551	2132	2222	AC	8.00	149.63	613.83	3.92
700	1553	2222	2228	AC	8.00	878.65	613.83	3.92
701	1555	2228	2226	AC	8.00	426.12	192.82	1.23
702	1561	2220	2218	AC	6.00	334.86	154.30	1.75
703	1563	2218	2216	AC	6.00	181.16	89.70	1.02
704	1567	2250	2230	AC	6.00	314.12	-179.45	2.04
705	1577	2078	2256	AC	6.00	646.88	-16.19	0.18
706	1579	2256	2254	AC	6.00	489.23	-16.19	0.18
707	1581	2254	2252	AC	6.00	751.89	-16.19	0.18
708	1583	2252	2226	AC	8.00	654.13	-66.35	0.42
709	1587	2224	2206	AC	6.00	1,015.22	115.88	1.31
710	1599	2268	2266	AC	10.00	995.34	184.97	0.76
711	1601	2268	2270	AC	8.00	245.24	-114.92	0.73
712	1603	2270	2280	AC	8.00	307.73	-7.85	0.05
713	1605	2270	2264	AC	6.00	977.09	-85.62	0.97
714	1607	2278	2272	AC	6.00	325.70	-21.47	0.24
715	1609	2272	2274	AC	6.00	326.10	-17.51	0.20
716	1611	2274	2276	AC	6.00	317.17	5.27	0.06
717	1613	2276	2258	AC	6.00	968.21	-23.65	0.27
718	1615	2274	2260	AC	6.00	968.72	-22.79	0.26
719	1617	2272	2262	AC	6.00	968.72	-25.41	0.29
720	1619	2272	2270	AC	6.00	308.11	21.45	0.24
721	1621	2252	2288	AC	8.00	309.73	50.16	0.32
722	1623	2288	2062	AC	8.00	343.25	79.09	0.50

H2ONET Customized Pipe Report - 1998 Peak Hour Demand

	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
723	1625	2288	2276	AC	6.00	181.39	-28.92	0.33
724	1627	2062	2290	AC	8.00	461.68	-27.68	0.18
725	1629	2290	2278	AC	6.00	344.33	-27.68	0.31
726	1631	2278	2280	AC	6.00	299.06	-6.21	0.07
727	1633	2280	2052	AC	6.00	248.10	-14.06	0.16
728	1635	2268	2282	AC	10.00	163.30	-70.04	0.29
729	1637	2282	2284	AC	10.00	145.21	-70.04	0.29
730	1639	2284	2050	AC	10.00	303.95	-70.04	0.29
731	1641	2266	2292	AC	10.00	317.04	217.70	0.89
732	1643	2292	2286	AC	8.00	597.91	217.70	1.39
733	1649	2266	2294	AC	10.00	280.61	346.81	1.42
734	1651	2294	2296	AC	10.00	316.65	469.13	1.92
735	1653	2296	2298	AC	10.00	298.55	5.96	0.02
736	1655	2300	2298	AC	8.00	118.10	430.35	2.75
737	1659	2296	2302	AC	10.00	302.18	175.90	0.72
738	1701	2308	2286	AC	8.00	356.44	-115.14	0.73
739	1703	86	1000	AC	6.00	99.34	-56.21	0.64
740	1705	2350	2348	AC	6.00	444.83	-35.31	0.40
741	1707	2348	2338	AC	6.00	642.55	-23.87	0.27
742	1709	2338	2340	AC	6.00	296.64	-23.87	0.27
743	1711	2340	40	AC	6.00	995.93	-47.88	0.54
744	1713	2340	2342	AC	6.00	291.26	24.01	0.27
745	1715	2342	2344	AC	6.00	181.75	24.01	0.27
746	1717	2344	2346	AC	6.00	335.04	24.01	0.27
747	1719	2346	2348	AC	6.00	477.47	11.44	0.13
748	1721	2350	54	AC	6.00	1,285.32	35.31	0.40
749	1723	2346	42	AC	6.00	791.01	12.57	0.14
750	1725	2360	240	AC	12.00	594.19	54.59	0.15
751	1727	2362	2360	AC	12.00	344.76	48.27	0.14
752	1729	2362	2356	AC	8.00	434.73	6.32	0.04
753	1731	2356	2354	AC	8.00	97.96	6.32	0.04
754	1733	2354	2352	AC	8.00	316.76	6.32	0.04
755	1735	2352	2358	AC	8.00	446.38	6.32	0.04
756	1737	2358	2360	AC	8.00	761.70	6.32	0.04
757	1741	2030	2020	AC	4.00	1,300.00	33.66	0.86
758	1743	840	2366	AC	12.00	202.41	1,121.02	3.18
759	1745	2366	2368	AC	12.00	366.22	1,121.02	3.18
760	1747	2368	2370	AC	12.00	663.97	874.46	2.48

H2ONET Customized Pipe Report - 1998 Peak Hour Demand

	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
761	1749	2370	2376	AC	12.00	685.47	874.46	2.48
762	1751	2376	2378	AC	12.00	641.60	505.27	1.43
763	1753	2378	2382	AC	12.00	641.60	622.88	1.77
764	1755	2382	2384	AC	12.00	298.12	579.17	1.64
765	1757	2384	2386	AC	12.00	641.60	579.17	1.64
766	1759	2386	2080	AC	12.00	372.97	394.57	1.12
767	1761	2368	2372	AC	8.00	1,296.51	246.56	1.57
768	1763	2372	2374	AC	8.00	663.93	246.56	1.57
769	1765	2374	2380	AC	8.00	656.51	117.61	0.75
770	1767	2380	2378	AC	8.00	618.41	117.61	0.75
771	1769	2376	2374	AC	10.00	618.59	51.97	0.21
772	1771	2374	2394	AC	10.00	822.32	180.91	0.74
773	1773	2394	2392	AC	10.00	581.92	180.91	0.74
774	1775	2392	2390	AC	10.00	59.61	180.91	0.74
775	1777	2390	2388	AC	10.00	678.89	180.91	0.74
776	1779	2388	2424	AC	8.00	774.92	180.91	1.15
777	1781	2410	2412	AC	8.00	305.94	159.33	1.02
778	1783	2408	2410	AC	8.00	529.70	110.04	0.70
779	1785	2412	2406	AC	8.00	298.48	115.96	0.74
780	1787	2410	2398	AC	8.00	764.44	-49.29	0.31
781	1789	2398	2396	AC	8.00	522.19	-49.29	0.31
782	1791	2386	2396	AC	10.00	151.48	-55.44	0.23
783	1793	2396	2408	AC	10.00	774.91	-104.73	0.43
784	1795	2414	2408	AC	10.00	797.37	-9.86	0.04
785	1797	2406	2402	AC	8.00	1,289.00	38.13	0.24
786	1799	2400	2412	AC	8.00	1,294.86	-43.37	0.28
787	1801	2080	2400	AC	12.00	823.29	261.10	0.74
788	1803	2400	2402	AC	12.00	305.86	304.47	0.86
789	1809	2418	2416	AC	8.00	777.63	-63.36	0.40
790	1811	2416	2406	AC	8.00	725.14	-77.82	0.50
791	1813	2416	2404	AC	8.00	1,288.99	10.38	0.07
792	1815	884	2418	AC	8.00	469.05	0.00	0.00
793	1817	878	2420	AC	8.00	642.57	-10.01	0.06
794	1819	2420	2422	AC	8.00	290.67	-10.01	0.06
795	1821	2422	880	AC	8.00	642.14	-10.01	0.06
796	1823	876	2404	AC	12.00	834.15	-177.21	0.50
797	1825	2424	2382	AC	8.00	635.49	-43.71	0.28
798	1827	2408	2424	AC	8.00	654.03	-224.63	1.43

H2ONET Customized Pipe Report - 1998 Peak Hour Demand

	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
799	1829	2434	912	AC	12.00	1,948.64	-163.54	0.46
800	1831	912	2426	AC	12.00	707.61	356.49	1.01
801	1833	2426	2428	AC	12.00	876.85	94.63	0.27
802	1835	2428	2430	AC	12.00	997.44	94.63	0.27
803	1837	2430	2432	AC	12.00	923.92	-303.08	0.86
804	1841	2438	2436	AC	8.00	698.00	136.63	0.87
805	1843	2436	2426	AC	8.00	535.76	136.63	0.87
806	1845	2444	906	AC	8.00	605.90	0.00	0.00
807	1847	914	2442	AC	8.00	255.51	173.77	1.11
808	1849	2442	2440	AC	8.00	837.03	-87.35	0.56
809	1851	2440	2432	AC	12.00	669.09	303.08	0.86
810	1853	2192	2450	AC	12.00	397.56	652.14	1.85
811	1855	2450	2452	AC	12.00	1,448.69	1,044.00	2.96
812	1857	2452	2440	AC	12.00	263.06	635.40	1.80
813	1859	2440	2446	AC	6.00	583.28	244.96	2.78
814	1861	2458	2456	AC	6.00	552.23	-62.17	0.71
815	1863	2456	2452	AC	6.00	604.67	-201.88	2.29
816	1865	2458	2460	AC	6.00	380.06	62.17	0.71
817	1867	2456	2454	AC	6.00	335.37	139.71	1.59
818	1869	2460	2454	AC	6.00	567.74	62.17	0.71
819	1871	2454	2446	AC	6.00	134.91	201.88	2.29
820	1873	2446	2448	AC	6.00	602.03	446.84	5.07
821	1875	2474	2476	AC	6.00	1,223.45	-40.59	0.46
822	1877	2476	2466	AC	6.00	290.96	-40.59	0.46
823	1879	2466	2468	AC	6.00	1,208.50	50.53	0.57
824	1881	2474	2468	AC	6.00	298.03	40.59	0.46
825	1883	2466	2464	AC	6.00	499.42	-258.40	2.93
826	1885	2464	2462	AC	6.00	1,075.16	-258.40	2.93
827	1887	2462	2478	AC	6.00	794.93	-258.40	2.93
828	1889	2468	2470	AC	8.00	521.55	91.12	0.58
829	1891	2470	2472	AC	8.00	500.04	0.00	0.00
830	1893	2478	2448	AC	6.00	487.85	-246.92	2.80
831	1895	2478	2480	AC	6.00	1,152.01	-11.48	0.13
832	1897	2480	2430	AC	6.00	1,563.60	-337.20	3.83
833	1899	2482	2450	AC	8.00	1,194.91	391.86	2.50
834	1901	2482	2190	AC	8.00	465.12	-391.86	2.50
835	1903	2490	2488	AC	8.00	456.08	0.00	0.00
836	1905	2488	2486	AC	8.00	676.48	-48.62	0.31

H2ONET Customized Pipe Report - 1998 Peak Hour Demand

	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
837	1907	2486	2484	AC	8.00	417.29	-48.62	0.31
838	113	104	110	CI	8.00	210.28	770.54	4.92
839	115	110	112	CI	8.00	796.91	770.54	4.92
840	117	112	108	CI	8.00	641.29	770.54	4.92
841	1153	930	932	CI	4.00	354.79	100.00	2.55
842	1157	936	934	CI	4.00	222.87	62.09	1.59
843	1159	934	938	CI	4.00	98.98	62.09	1.59
844	1161	938	916	CI	4.00	255.71	36.13	0.92
845	1163	916	940	CI	4.00	65.99	36.13	0.92
846	1165	940	864	CI	4.00	296.64	17.57	0.45
847	1173	936	946	CI	4.00	1,419.03	37.91	0.97
848	1175	938	944	CI	4.00	1,435.34	25.96	0.66
849	1177	940	942	CI	4.00	1,542.58	18.56	0.47
850	1189	930	970	CI	6.00	197.97	-161.05	1.83
851	1191	970	928	CI	6.00	190.43	556.35	6.31
852	1205	930	948	CI	4.00	1,426.98	61.05	1.56
853	1221	966	950	CI	8.00	437.22	-149.20	0.95
854	1279	976	948	CI	4.00	1,641.10	-13.86	0.35
855	1281	978	946	CI	4.00	1,613.36	-9.94	0.25
856	1283	980	944	CI	4.00	1,555.57	-5.25	0.13
857	1285	982	942	CI	4.00	1,448.21	-5.92	0.15
858	1295	2010	976	CI	4.00	1,274.38	18.47	0.47
859	1297	2012	978	CI	4.00	1,319.78	17.45	0.45
860	1323	2030	2032	CI	6.00	724.66	33.63	0.38
861	1325	2034	2032	CI	8.00	425.83	-132.19	0.84
862	1327	2032	2038	CI	8.00	1,130.92	-98.55	0.63
863	1329	2034	360	CI	4.00	1,303.74	-98.64	2.52
864	1333	2038	2040	CI	6.00	353.39	-98.55	1.12
865	1335	2040	2026	CI	6.00	625.61	-245.45	2.79
866	1339	2034	2042	CI	8.00	1,285.70	37.71	0.24
867	1351	2050	2052	CI	6.00	307.98	-34.13	0.39
868	1353	2052	364	CI	4.00	2,610.47	-48.19	1.23
869	1523	2234	2198	CI	6.00	431.07	-28.01	0.32
870	1525	2234	2240	CI	6.00	1,168.65	28.01	0.32
871	1535	2240	2242	CI	6.00	2,030.33	90.88	1.03
872	1537	2242	926	CI	6.00	436.82	-244.02	2.77
873	1543	2246	2244	CI	8.00	543.49	-185.95	1.19
874	1573	2224	2232	CI	4.00	281.04	-52.85	1.35

H2ONET Customized Pipe Report - 1998 Peak Hour Demand

	LINK: ID (Char)	LINK: FROM (Char)	LINK: TO (Char)	PIPE: MATERIAL (Char)	PIPEHYD: DIAMETER (Num)	PIPEHYD: LENGTH (Num)	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)
875	1575	2232	2226	CI	6.00	298.55	-87.92	1.00
876	1589	2226	2258	CI	8.00	189.84	38.55	0.25
877	1591	2258	2260	CI	8.00	299.06	14.91	0.10
878	1593	2260	2262	CI	8.00	326.10	-7.88	0.05
879	1595	2262	2264	CI	8.00	344.21	-248.17	1.58
880	1597	2264	2266	CI	8.00	262.69	379.55	2.42
881	1657	2298	2246	CI	10.00	702.92	436.31	1.78
882	379	1002	324	DI	12.00	45.71	3,139.37	8.91
883	381	324	116	DI	12.00	72.37	2,910.66	8.26
884	383	102	116	DI	12.00	173.86	0.00	0.00
885	1217	962	964	DI	12.00	131.82	-260.68	0.74
886	1219	962	966	DI	12.00	842.80	362.16	1.03
887	1545	2244	2248	DI	12.00	36.19	-137.67	0.39
888	1661	2302	2304	DI	12.00	589.41	175.90	0.50
889	1663	2304	2306	DI	12.00	353.39	254.44	0.72
890	1665	2306	964	DI	12.00	296.17	260.68	0.74
891	1669	2316	2320	DI	8.00	110.48	156.20	1.00
892	1671	2316	2286	DI	8.00	687.00	-24.02	0.15
893	1673	2316	2046	DI	8.00	603.38	-132.18	0.84
894	1675	2320	2310	DI	12.00	249.43	156.20	0.44
895	1677	2310	2308	DI	12.00	669.55	93.73	0.27
896	1679	2310	2044	DI	12.00	620.60	62.47	0.18
897	1681	2286	2304	DI	8.00	561.13	78.54	0.50
898	1683	2304	2322	DI	8.00	455.97	0.00	0.00
899	1685	2308	2306	DI	12.00	588.34	149.71	0.42
900	1687	2306	2324	DI	8.00	366.43	0.00	0.00
901	1689	2248	2332	DI	12.00	364.75	-137.67	0.39
902	1691	2332	2328	DI	12.00	238.40	-137.67	0.39
903	1693	2328	966	DI	12.00	392.71	-137.67	0.39
904	1695	2334	2332	DI	8.00	342.83	0.00	0.00
905	1697	2336	2328	DI	8.00	383.47	0.00	0.00
906	1909	2100	2098	PVC	12.00	40.00	983.59	2.79
907	1911	2102	2096		12.00	40.00	78.18	0.22

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
1	2	435.00	0.00	28.58	500.92
2	4	430.00	0.00	30.74	500.92
3	6	430.00	0.00	30.74	500.92
4	8	430.00	7.14	30.74	500.92
5	10	425.00	0.00	32.91	500.92
6	12	425.00	75.82	32.91	500.92
7	14	450.00	0.00	22.07	500.92
8	16	420.00	149.94	34.37	499.29
9	18	415.00	142.80	36.11	498.30
10	20	415.00	80.92	35.85	497.70
11	22	411.00	75.82	37.57	497.68
12	24	416.00	0.00	35.30	497.44
13	26	416.00	0.00	35.27	497.37
14	28	416.00	0.00	35.26	497.33
15	30	417.00	0.00	34.80	497.29
16	32	418.00	215.90	34.00	496.42
17	34	418.00	0.00	34.09	496.64
18	36	419.00	0.00	33.75	496.86
19	38	420.00	0.00	33.48	497.23
20	40	418.00	0.00	33.85	496.09
21	42	419.00	0.00	33.24	495.69
22	44	423.00	564.06	31.30	495.21
23	46	417.00	0.00	34.58	496.78
24	50	418.00	0.00	34.68	497.99
25	52	420.00	172.04	33.58	497.46
26	54	420.00	0.00	32.68	495.39
27	56	420.00	0.00	33.36	496.97
28	58	422.00	0.00	32.24	496.36
29	60	421.00	0.00	33.05	497.24
30	62	421.00	0.00	32.17	495.21
31	64	437.00	0.00	25.23	495.21
32	66	432.00	0.00	30.65	502.71
33	68	434.00	0.00	31.37	506.37
34	70	433.00	0.00	31.80	506.36
35	72	427.00	239.70	34.38	506.31
36	74	427.00	0.00	35.82	509.63
37	76	428.00	0.00	35.24	509.30
38	78	428.00	0.00	33.95	506.31

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psl)	OUTPUT: GRADE (ft)
39	80	437.00	0.00	30.05	506.31
40	82	430.00	0.00	33.08	506.31
41	84	557.00	0.00	53.77	681.03
42	86	660.00	74.80	9.09	680.96
43	88	510.00	0.00	74.14	681.03
44	90	510.00	0.00	74.14	681.03
45	92	510.00	0.00	74.14	681.03
46	94	551.00	51.68	56.38	681.07
47	96	551.00	87.72	56.41	681.13
48	98	551.00	70.72	56.52	681.39
49	100	575.00	0.00	47.44	684.44
50	102	565.00	0.00	12.71	594.33
51	104	570.00	0.00	7.59	587.50
52	106	448.00	153.34	51.47	566.74
53	108	450.00	0.00	46.40	557.04
54	110	450.00	0.00	57.92	583.62
55	112	457.00	0.00	48.50	568.89
56	116	570.00	0.00	10.55	594.33
57	118	480.00	0.00	49.56	594.33
58	120	444.00	0.00	31.00	515.50
59	122	445.00	0.00	64.73	594.33
60	124	443.00	0.00	31.20	514.96
61	128	441.00	0.00	32.64	516.28
62	130	443.00	0.00	31.55	515.77
63	132	447.00	0.00	46.56	554.41
64	134	445.00	0.00	43.96	546.40
65	136	445.00	0.00	37.44	531.37
66	138	448.00	339.32	30.79	519.02
67	140	453.00	0.00	43.43	553.19
68	142	455.00	0.00	42.69	553.49
69	164	415.00	0.00	39.69	506.55
70	166	416.00	0.00	39.26	506.55
71	168	419.00	187.68	37.95	506.55
72	170	420.00	0.00	37.44	506.36
73	172	419.00	0.00	37.34	505.13
74	174	420.00	0.00	35.36	501.57
75	176	417.00	0.00	36.07	500.21
76	178	418.00	0.00	35.48	499.84

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
77	180	417.00	0.00	35.36	498.56
78	182	418.00	0.00	35.64	500.22
79	184	419.00	0.00	35.40	500.67
80	186	420.00	0.00	35.20	501.21
81	188	419.00	0.00	35.41	500.67
82	190	421.00	209.44	36.14	504.37
83	192	420.00	0.00	37.69	506.94
84	194	420.00	0.00	37.68	506.92
85	196	422.00	0.00	40.61	515.69
86	198	424.00	0.00	39.65	515.47
87	200	425.00	164.90	39.22	515.48
88	202	422.00	0.00	37.53	508.57
89	204	421.00	0.00	37.96	508.57
90	206	421.00	0.00	38.32	509.40
91	208	422.00	0.00	38.55	510.92
92	210	423.00	0.00	38.81	512.53
93	212	422.00	0.00	38.05	509.77
94	214	424.00	0.00	37.85	511.31
95	216	421.00	0.00	41.20	516.04
96	226	418.00	0.00	42.07	515.04
97	228	424.00	0.00	33.73	501.81
98	230	421.00	0.00	34.14	499.76
99	232	420.00	0.00	34.21	498.91
100	234	426.00	295.80	38.85	515.62
101	236	426.00	216.58	32.88	501.85
102	238	423.00	333.20	32.55	498.09
103	240	429.00	0.00	36.96	514.27
104	242	429.00	291.04	36.96	514.27
105	244	431.00	0.00	36.11	514.29
106	246	431.00	167.28	36.11	514.29
107	248	425.00	0.00	32.87	500.83
108	250	426.00	0.00	32.31	500.53
109	252	425.00	0.00	32.67	500.36
110	254	427.00	0.00	31.48	499.61
111	256	427.00	0.00	31.41	499.47
112	258	428.00	0.00	30.84	499.14
113	260	425.00	0.00	38.33	513.42
114	262	425.00	0.00	38.36	513.50

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
115	264	430.00	312.46	36.15	513.39
116	266	430.00	284.92	34.51	509.60
117	268	433.00	0.00	35.21	514.23
118	270	432.00	0.00	35.66	514.26
119	272	433.00	0.00	35.35	514.54
120	274	444.00	0.00	65.17	594.33
121	276	442.00	0.00	31.98	515.77
122	278	443.00	0.00	65.60	594.33
123	280	442.00	0.00	66.03	594.33
124	282	437.00	0.00	33.75	514.86
125	284	437.00	251.94	33.70	514.74
126	286	438.00	0.00	33.48	515.24
127	288	438.00	0.00	33.47	515.21
128	290	435.00	0.00	34.44	514.46
129	292	435.00	0.00	34.44	514.45
130	294	435.00	0.00	34.42	514.40
131	296	435.00	0.00	34.40	514.34
132	298	435.00	0.00	34.38	514.30
133	300	435.00	0.00	34.10	513.66
134	302	437.00	0.00	33.61	514.53
135	304	437.00	0.00	33.58	514.46
136	306	437.00	0.00	33.26	513.72
137	308	439.00	0.00	32.46	513.87
138	310	440.00	0.00	32.18	514.24
139	312	440.00	215.56	32.24	514.38
140	314	439.00	210.46	32.68	514.40
141	316	445.00	0.00	31.65	518.00
142	318	444.00	0.00	31.88	517.54
143	320	449.00	130.90	26.39	509.87
144	322	449.00	0.00	102.57	685.62
145	324	448.00	0.00	64.10	595.88
146	326	459.00	0.00	45.10	563.05
147	328	458.00	0.00	45.54	563.05
148	332	447.00	0.00	31.77	520.29
149	338	447.00	0.00	31.78	520.32
150	340	447.00	53.38	31.74	520.22
151	346	447.00	10.20	79.59	630.59
152	348	447.00	0.00	31.77	520.29

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psl)	OUTPUT: GRADE (ft)
153	352	445.00	0.00	32.25	519.40
154	356	446.00	0.00	31.75	519.24
155	358	446.00	0.00	39.76	537.72
156	360	445.00	0.00	38.37	533.51
157	362	445.00	0.00	36.12	528.33
158	364	444.00	0.00	35.80	526.58
159	396	419.00	0.00	41.63	515.04
160	398	420.00	0.00	41.19	515.03
161	400	420.00	0.00	41.19	515.02
162	436	421.00	0.00	40.76	515.02
163	614	430.00	0.00	46.01	536.14
164	618	420.00	0.00	42.02	516.92
165	620	422.00	0.00	42.65	520.38
166	622	423.00	0.00	43.04	522.28
167	624	423.00	0.00	43.52	523.38
168	626	426.00	0.00	42.72	524.55
169	628	419.00	147.90	41.77	515.35
170	630	424.00	0.00	43.55	524.45
171	632	424.00	0.00	44.21	525.99
172	634	427.00	140.42	44.42	529.46
173	636	420.00	0.00	41.40	515.49
174	638	427.00	0.00	49.70	541.65
175	640	428.00	0.00	47.33	537.18
176	642	427.00	0.00	43.70	527.80
177	644	431.00	398.82	36.47	515.13
178	646	433.00	0.00	38.80	522.50
179	648	433.00	0.00	36.61	517.46
180	650	434.00	0.00	37.30	520.04
181	652	435.00	242.76	37.10	520.59
182	654	436.00	0.00	36.30	519.75
183	656	432.00	321.98	40.89	526.32
184	658	432.00	0.00	40.15	524.62
185	660	433.00	0.00	40.99	527.55
186	662	434.00	0.00	40.79	528.10
187	664	434.00	0.00	40.96	528.49
188	666	434.00	0.00	44.69	537.08
189	668	433.00	0.00	44.27	535.12
190	670	434.00	0.00	44.83	537.41

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
191	672	434.00	0.00	45.35	538.62
192	674	435.00	0.00	43.69	535.79
193	676	435.00	0.00	43.69	535.79
194	678	435.00	0.00	42.44	532.90
195	680	435.00	351.56	42.20	532.35
196	682	432.00	300.22	44.74	535.21
197	684	429.00	0.00	45.77	534.59
198	686	430.00	0.00	45.12	534.08
199	688	430.00	0.00	45.04	533.89
200	690	432.00	0.00	43.76	532.94
201	692	430.00	239.36	44.37	532.35
202	694	428.00	0.00	46.61	535.53
203	696	428.00	167.62	46.64	535.60
204	698	427.00	0.00	47.03	535.48
205	700	428.00	0.00	46.56	535.40
206	702	427.00	0.00	46.98	535.38
207	704	428.00	194.48	46.56	535.40
208	706	428.00	0.00	46.51	535.29
209	708	428.00	0.00	46.48	535.22
210	710	428.00	0.00	46.40	535.04
211	712	428.00	0.00	46.51	535.30
212	714	429.00	0.00	46.12	535.40
213	716	432.00	0.00	43.50	532.35
214	718	437.00	0.00	39.40	527.89
215	720	438.00	0.00	36.14	521.37
216	722	428.00	0.00	47.36	537.25
217	724	428.00	0.00	47.54	537.67
218	726	429.00	0.00	47.28	538.06
219	730	435.00	0.00	34.45	514.48
220	732	437.00	130.22	33.66	514.64
221	734	438.00	0.00	33.31	514.83
222	736	438.00	0.00	33.32	514.87
223	738	439.00	0.00	32.89	514.87
224	740	439.00	0.00	34.23	517.96
225	742	436.00	0.00	35.22	517.25
226	744	436.00	0.00	35.53	517.96
227	746	436.00	0.00	35.70	518.35
228	748	440.00	217.94	33.79	517.96

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
229	750	439.00	0.00	32.90	514.90
230	752	440.00	0.00	32.48	514.93
231	754	440.00	303.62	32.49	514.94
232	756	442.00	0.00	31.84	515.45
233	758	440.00	0.00	32.50	514.98
234	760	442.00	0.00	31.65	515.02
235	762	439.00	141.78	32.86	514.80
236	764	438.00	0.00	33.29	514.78
237	766	437.00	0.00	33.71	514.77
238	768	437.00	0.00	33.71	514.76
239	770	444.00	0.00	30.97	515.45
240	772	438.00	0.00	33.29	514.80
241	774	438.00	0.00	33.29	514.80
242	776	436.00	0.00	34.15	514.78
243	778	435.00	0.00	34.58	514.78
244	780	435.00	0.00	34.58	514.77
245	782	437.00	0.00	33.66	514.66
246	784	442.00	0.00	31.72	515.18
247	786	439.00	0.00	32.71	514.46
248	788	443.00	0.00	31.52	515.71
249	790	444.00	0.00	31.13	515.81
250	792	445.00	0.00	30.73	515.88
251	794	447.00	556.24	29.76	515.64
252	796	448.00	0.00	29.60	516.29
253	798	449.00	0.00	29.31	516.61
254	800	446.00	0.00	30.45	516.25
255	802	445.00	255.00	30.88	516.22
256	804	445.00	0.00	30.88	516.22
257	806	449.00	0.00	29.31	516.61
258	808	447.00	0.00	30.30	516.90
259	810	447.00	0.00	30.12	516.49
260	812	449.00	0.00	29.26	516.51
261	814	450.00	0.00	28.89	516.64
262	816	452.00	0.00	28.04	516.68
263	818	451.00	0.00	28.45	516.63
264	820	453.00	0.00	27.61	516.70
265	822	446.00	0.00	30.18	515.63
266	824	437.00	0.00	36.02	520.09

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
267	826	441.00	406.64	33.24	517.67
268	828	440.00	0.00	33.67	517.67
269	830	438.00	0.00	35.86	520.73
270	832	430.00	0.00	45.25	534.39
271	834	430.00	0.00	44.49	532.63
272	836	430.00	0.00	44.03	531.57
273	838	431.00	0.00	42.39	528.78
274	840	435.00	59.84	37.94	522.51
275	842	440.00	246.84	34.18	518.84
276	844	441.00	297.84	33.77	518.91
277	846	443.00	0.00	32.64	518.28
278	848	444.00	188.02	31.97	517.75
279	850	444.00	0.00	31.57	516.83
280	852	442.00	0.00	32.76	517.56
281	854	444.00	0.00	32.07	517.98
282	856	443.00	164.56	32.11	517.07
283	858	445.00	0.00	31.51	517.68
284	860	447.00	268.60	30.24	516.76
285	862	445.00	0.00	31.62	517.95
286	864	447.00	0.00	30.25	516.77
287	866	447.00	0.00	29.95	516.08
288	868	448.00	40.46	28.92	514.72
289	870	439.00	147.56	32.82	514.70
290	872	440.00	0.00	32.38	514.70
291	874	447.00	0.00	30.12	516.48
292	876	449.00	0.00	28.30	514.28
293	878	448.00	130.22	28.73	514.27
294	880	447.00	0.00	29.16	514.28
295	884	446.00	0.00	29.60	514.29
296	886	450.00	0.00	27.74	513.99
297	888	452.00	228.48	26.68	513.55
298	890	452.00	0.00	26.59	513.34
299	892	452.00	270.98	26.46	513.03
300	894	453.00	0.00	26.16	513.35
301	896	452.00	0.00	26.65	513.47
302	898	454.00	0.00	25.50	512.83
303	900	455.00	0.00	25.04	512.76
304	902	455.00	0.00	25.18	513.08

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
305	904	455.00	114.58	25.87	514.67
306	906	455.00	261.12	24.60	511.74
307	908	456.00	0.00	23.96	511.28
308	910	458.00	0.00	22.85	510.70
309	912	457.00	0.00	23.04	510.14
310	914	459.00	0.00	22.24	510.29
311	916	448.00	0.00	29.93	517.04
312	918	448.00	399.16	29.52	516.10
313	920	449.00	0.00	29.07	516.06
314	922	450.00	0.00	28.62	516.02
315	924	451.00	0.00	28.17	515.97
316	926	452.00	0.00	27.71	515.93
317	928	452.00	0.00	27.99	516.56
318	930	451.00	0.00	31.46	523.56
319	932	450.00	0.00	29.99	519.18
320	934	449.00	0.00	29.92	518.03
321	936	450.00	0.00	29.99	519.17
322	938	449.00	0.00	29.70	517.52
323	940	448.00	0.00	29.88	516.92
324	942	448.00	0.00	29.51	516.07
325	944	449.00	377.40	29.07	516.06
326	946	450.00	0.00	28.72	516.25
327	948	451.00	0.00	28.39	516.48
328	950	452.00	0.00	28.01	516.61
329	952	452.00	0.00	27.99	516.58
330	958	452.00	0.00	28.09	516.80
331	960	452.00	0.00	28.06	516.72
332	962	454.00	0.00	27.14	516.60
333	964	454.00	0.00	27.15	516.63
334	966	453.00	209.10	27.41	516.22
335	968	453.00	0.00	27.24	515.83
336	970	452.00	0.00	31.38	524.38
337	972	453.00	0.00	27.61	516.70
338	974	455.00	0.00	25.98	514.93
339	976	452.00	344.42	27.73	515.96
340	978	450.00	0.00	28.60	515.98
341	980	449.00	0.00	29.03	515.98
342	982	448.00	0.00	29.47	515.98

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
343	984	447.00	0.00	29.90	515.98
344	986	445.00	0.00	30.75	515.92
345	990	444.00	0.00	31.15	515.85
346	992	446.00	0.00	30.35	516.02
347	994	445.00	0.00	30.79	516.02
348	996	445.00	290.02	30.83	516.12
349	998	444.00	289.34	31.15	515.85
350	2000	447.00	0.00	29.95	516.08
351	2002	447.00	0.00	29.92	516.02
352	2004	445.00	0.00	30.74	515.90
353	2006	442.00	0.00	31.96	515.72
354	2008	442.00	0.00	32.57	517.14
355	2010	451.00	0.00	28.46	516.65
356	2012	450.00	0.00	28.88	516.62
357	2014	454.00	0.00	27.20	516.74
358	2018	454.00	0.00	27.20	516.74
359	2020	454.00	0.00	27.19	516.73
360	2024	445.00	0.00	36.26	528.65
361	2026	445.00	0.00	34.59	524.80
362	2030	449.00	0.00	30.02	518.26
363	2032	450.00	0.00	29.52	518.09
364	2034	450.00	193.12	29.39	517.79
365	2038	448.00	0.00	30.59	518.56
366	2040	448.00	0.00	30.84	519.15
367	2042	457.00	0.00	26.31	517.70
368	2044	455.00	491.64	26.78	516.77
369	2046	456.00	0.00	26.52	517.19
370	2048	456.00	0.00	26.43	516.96
371	2050	458.00	0.00	26.07	518.14
372	2052	459.00	0.00	25.67	518.21
373	2054	455.00	194.48	28.85	521.55
374	2056	463.00	0.00	26.82	524.87
375	2058	472.00	0.00	23.39	525.95
376	2060	468.00	0.00	25.12	525.95
377	2062	466.00	440.30	22.61	518.15
378	2064	450.00	0.00	31.02	521.55
379	2078	483.00	0.00	15.24	518.17
380	2080	438.00	0.00	33.28	514.77

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
381	2132	481.00	0.00	20.23	527.68
382	2134	483.00	0.00	19.37	527.68
383	2150	471.00	0.00	28.05	535.71
384	2152	470.00	0.00	28.49	535.71
385	2154	471.00	0.00	28.05	535.71
386	2188	467.00	27.20	27.23	529.81
387	2190	466.00	98.94	24.07	521.53
388	2192	464.00	205.02	22.46	515.80
389	2194	470.00	0.00	25.59	529.03
390	2196	469.00	0.00	24.87	526.38
391	2198	463.00	153.34	22.63	515.20
392	2200	459.00	230.18	24.22	514.88
393	2202	458.00	0.00	24.79	515.19
394	2204	457.00	0.00	25.31	515.40
395	2206	460.00	0.00	23.94	515.23
396	2208	460.00	332.52	23.87	515.07
397	2210	460.00	0.00	23.89	515.12
398	2212	463.00	3.40	22.64	515.23
399	2214	474.00	95.20	17.94	515.38
400	2216	473.00	0.00	18.86	516.51
401	2218	475.00	64.60	18.07	516.69
402	2220	477.00	0.00	17.60	517.61
403	2222	480.00	0.00	20.11	526.38
404	2224	461.00	0.00	24.22	516.87
405	2226	464.00	0.00	23.56	518.34
406	2228	468.00	0.00	22.01	518.77
407	2230	466.00	0.00	22.54	518.00
408	2232	463.00	0.00	23.81	517.93
409	2234	463.00	0.00	22.60	515.13
410	2240	459.00	0.00	24.25	514.94
411	2242	452.00	334.90	26.02	512.02
412	2244	455.00	0.00	26.50	516.14
413	2246	457.00	414.12	25.32	515.42
414	2248	455.00	0.00	26.51	516.14
415	2250	465.00	0.00	22.49	516.87
416	2252	467.00	0.00	22.22	518.25
417	2254	475.00	0.00	18.73	518.21
418	2256	482.00	0.00	15.69	518.19

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
419	2258	464.00	0.00	23.55	518.32
420	2260	463.00	0.00	23.98	518.32
421	2262	462.00	214.88	24.42	518.32
422	2264	460.00	0.00	25.62	519.10
423	2266	459.00	0.00	25.49	517.79
424	2268	460.00	0.00	25.19	518.11
425	2270	460.00	0.00	25.23	518.21
426	2272	462.00	0.00	24.37	518.23
427	2274	464.00	0.00	23.51	518.24
428	2276	466.00	0.00	22.65	518.24
429	2278	461.00	0.00	24.80	518.20
430	2280	460.00	0.00	25.23	518.21
431	2282	459.00	0.00	25.63	518.12
432	2284	459.00	0.00	25.63	518.13
433	2286	456.00	0.00	26.40	516.90
434	2288	467.00	0.00	22.20	518.22
435	2290	463.00	0.00	23.91	518.17
436	2292	458.00	0.00	25.86	517.66
437	2294	459.00	0.00	25.36	517.51
438	2296	458.00	238.00	25.55	516.95
439	2298	457.00	0.00	25.99	516.95
440	2300	457.00	0.00	26.22	517.48
441	2302	457.00	0.00	25.95	516.86
442	2304	455.00	0.00	26.79	516.79
443	2306	455.00	143.48	26.75	516.71
444	2308	455.00	0.00	26.77	516.76
445	2310	456.00	0.00	26.35	516.78
446	2316	457.00	0.00	25.96	516.88
447	2320	457.00	0.00	25.93	516.81
448	2322	455.00	0.00	26.79	516.79
449	2324	454.00	0.00	27.18	516.71
450	2328	454.00	0.00	26.96	516.19
451	2332	455.00	0.00	26.52	516.17
452	2334	455.00	0.00	26.52	516.17
453	2336	454.00	0.00	26.96	516.19
454	2186	485.00	0.00	24.99	542.65
455	2184	505.00	0.00	14.32	538.04
456	2182	497.00	0.00	18.32	539.25

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
457	2180	510.00	0.00	12.09	537.88
458	2178	510.00	0.00	11.27	535.99
459	2176	505.00	0.00	13.44	535.99
460	2174	500.00	224.40	15.60	535.99
461	2172	515.00	0.00	9.60	537.15
462	2170	490.00	33.66	21.88	540.47
463	2168	485.00	48.62	24.04	540.45
464	2166	488.00	0.00	22.75	540.48
465	2160	478.00	0.00	28.97	544.82
466	2158	476.00	0.00	28.89	542.65
467	2156	475.00	0.00	28.91	541.69
468	2148	600.00	0.00	13.10	630.22
469	2146	540.00	0.00	39.11	630.22
470	2144	540.00	0.00	4.43	550.22
471	2142	540.00	0.00	4.43	550.22
472	2140	540.00	246.84	4.43	550.22
473	2138	505.00	0.00	19.70	550.43
474	2136	493.00	0.00	24.98	550.63
475	2130	485.00	115.60	24.07	540.53
476	2128	490.00	0.00	22.62	542.19
477	2126	492.00	0.00	22.53	543.97
478	2124	510.00	51.68	14.58	543.64
479	2122	514.00	0.00	12.97	543.93
480	2120	486.00	0.00	26.70	547.58
481	2118	490.00	0.00	24.33	546.12
482	2116	490.00	0.00	23.64	544.53
483	2114	491.00	0.00	20.34	537.92
484	2112	485.00	0.00	23.74	539.76
485	2106	490.00	0.00	26.37	550.83
486	2104	535.00	0.00	31.28	607.16
487	2102	510.00	0.00	27.55	573.55
488	2100	525.00	0.00	25.41	583.63
489	2098	525.00	0.00	25.38	583.54
490	2096	509.00	0.00	27.98	573.55
491	2094	499.00	0.00	16.90	537.98
492	2092	500.00	0.00	16.74	538.63
493	2090	498.00	0.00	17.50	538.37
494	2088	504.00	0.00	16.45	541.94

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
495	2086	507.00	0.00	16.13	544.21
496	2084	497.00	0.00	19.32	541.56
497	2082	500.00	191.76	18.02	541.56
498	2164	476.00	0.00	26.12	536.24
499	2162	475.00	0.00	26.49	536.11
500	2110	483.00	0.00	23.38	536.94
501	2108	488.00	0.00	21.05	536.57
502	2076	494.00	0.00	18.23	536.04
503	2074	497.00	23.46	15.92	533.73
504	2072	498.00	0.00	14.25	530.87
505	2070	495.00	0.00	15.03	529.67
506	2068	502.00	0.00	12.00	529.67
507	2066	486.00	173.74	18.04	527.62
508	378	527.00	0.00	45.89	632.85
509	376	513.00	0.00	51.84	632.59
510	370	511.00	127.16	52.67	632.50
511	368	500.00	0.00	57.08	631.68
512	366	500.00	287.64	57.02	631.53
513	374	572.00	0.00	23.16	625.43
514	380	558.00	38.76	25.37	616.52
515	146	470.00	0.00	42.52	568.08
516	144	451.00	257.72	50.75	568.08
517	344	452.00	0.00	60.03	590.47
518	342	447.00	0.00	61.09	587.91
519	616	426.00	0.00	43.32	525.93
520	612	422.00	0.00	41.12	516.86
521	610	420.00	0.00	41.99	516.86
522	608	420.00	0.00	41.99	516.86
523	606	421.00	0.00	41.66	517.11
524	604	420.00	209.44	41.99	516.86
525	602	422.00	0.00	41.43	517.56
526	600	422.00	0.00	41.42	517.54
527	598	421.00	0.00	42.48	518.99
528	594	420.00	0.00	42.48	518.00
529	592	419.00	0.00	42.82	517.79
530	590	417.00	0.00	42.47	514.96
531	588	416.00	0.00	42.90	514.96
532	586	416.00	355.98	42.90	514.96

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psl)	OUTPUT: GRADE (ft)
533	584	418.00	0.00	43.14	517.53
534	582	418.00	252.96	43.09	517.40
535	580	417.00	0.00	43.06	516.33
536	578	416.00	0.00	44.03	517.56
537	576	415.00	0.00	43.66	515.72
538	574	414.00	0.00	43.73	514.88
539	572	415.00	0.00	43.14	514.51
540	570	413.00	0.00	44.06	514.63
541	568	411.00	0.00	44.92	514.63
542	566	415.00	0.00	42.70	513.50
543	564	414.00	0.00	42.31	511.61
544	562	411.00	0.00	43.61	511.61
545	560	411.00	0.00	43.61	511.61
546	558	414.00	0.00	42.31	511.61
547	556	415.00	187.00	41.88	511.61
548	554	415.00	0.00	43.13	514.49
549	552	417.00	0.00	42.45	514.91
550	550	415.00	402.90	43.18	514.61
551	548	417.00	0.00	42.51	515.06
552	546	419.00	0.00	41.62	515.01
553	544	421.00	0.00	40.77	515.04
554	542	419.00	0.00	41.56	514.87
555	540	422.00	0.00	40.33	515.03
556	538	420.00	0.00	40.87	514.29
557	536	422.00	0.00	40.37	515.14
558	534	422.00	359.38	40.34	515.06
559	532	425.00	0.00	40.25	517.86
560	530	426.00	358.02	40.28	518.92
561	528	427.00	0.00	39.67	518.52
562	526	426.00	0.00	39.88	518.00
563	524	422.00	0.00	40.30	514.97
564	520	423.00	0.00	39.88	514.99
565	518	423.00	0.00	39.88	515.01
566	516	423.00	0.00	40.08	515.45
567	514	425.00	0.00	40.11	517.53
568	512	428.00	157.42	38.94	517.83
569	510	426.00	0.00	39.69	517.57
570	488	428.00	0.00	44.94	531.67

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
571	482	428.00	0.00	46.25	534.70
572	478	427.00	205.70	39.21	517.44
573	476	427.00	0.00	43.89	528.24
574	474	426.00	0.00	42.68	524.45
575	472	425.00	0.00	41.61	520.98
576	470	425.00	0.00	40.71	518.92
577	468	423.00	138.38	39.86	514.96
578	466	424.00	0.00	40.19	516.72
579	464	425.00	0.00	40.07	517.43
580	462	425.00	0.00	40.18	517.70
581	460	424.00	0.00	40.22	516.77
582	452	424.00	0.00	39.92	516.08
583	450	422.00	0.00	40.40	515.19
584	448	422.00	0.00	40.25	514.86
585	446	420.00	0.00	40.78	514.08
586	444	417.00	0.00	41.84	513.51
587	440	421.00	172.04	40.67	514.83
588	434	415.00	0.00	42.77	513.66
589	432	416.00	0.00	42.29	513.56
590	430	416.00	0.00	42.28	513.53
591	428	417.00	0.00	41.84	513.51
592	426	418.00	210.12	41.39	513.48
593	424	419.00	0.00	41.04	513.68
594	422	419.00	0.00	41.00	513.57
595	420	417.00	0.00	41.84	513.51
596	418	418.00	0.00	41.41	513.52
597	416	417.00	0.00	41.84	513.51
598	414	418.00	0.00	41.40	513.51
599	406	414.00	0.00	43.17	513.59
600	404	414.00	0.00	43.17	513.59
601	402	414.00	187.00	43.17	513.59
602	728	430.00	0.00	45.02	533.85
603	480	428.00	0.00	44.98	531.76
604	498	429.00	0.00	47.04	537.51
605	494	429.00	250.58	50.50	545.50
606	484	428.00	0.00	48.06	538.87
607	486	431.00	0.00	62.56	575.32
608	490	429.00	0.00	47.28	538.06

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
609	496	432.00	0.00	62.39	575.91
610	492	430.00	0.00	51.15	548.00
611	500	435.00	0.00	69.43	595.16
612	502	435.00	49.64	71.01	598.81
613	504	435.00	0.00	71.38	599.65
614	508	436.00	0.00	71.30	600.47
615	506	436.00	0.00	71.67	601.33
616	442	414.00	0.00	43.18	513.62
617	412	417.00	0.00	41.84	513.51
618	410	418.00	0.00	41.39	513.47
619	408	414.00	0.00	43.17	513.58
620	392	414.00	142.12	43.17	513.58
621	390	418.00	183.26	41.34	513.36
622	388	416.00	0.00	42.28	513.54
623	386	418.00	0.00	41.35	513.38
624	384	418.00	0.00	41.35	513.40
625	382	416.00	0.00	42.30	513.57
626	222	415.00	0.00	42.77	513.65
627	220	415.00	100.98	42.87	513.88
628	158	413.00	0.00	43.63	513.64
629	438	421.00	0.00	40.76	515.02
630	150	412.00	0.00	44.02	513.54
631	224	418.00	0.00	42.07	515.04
632	156	411.00	0.00	44.44	513.51
633	154	410.00	0.00	44.81	513.36
634	152	411.00	192.78	44.30	513.19
635	148	411.00	0.00	44.44	513.51
636	218	418.00	0.00	34.68	497.99
637	160	414.00	198.22	36.30	497.73
638	162	415.00	0.00	35.86	497.73
639	2338	416.00	0.00	34.57	495.75
640	2340	417.00	0.00	34.15	495.78
641	2342	418.00	0.00	33.71	495.75
642	2344	418.00	0.00	33.70	495.74
643	2346	418.00	0.00	33.69	495.71
644	2348	418.00	0.00	33.68	495.70
645	2350	420.00	0.00	32.78	495.62
646	2352	432.00	0.00	35.67	514.28

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
647	2354	431.00	0.00	36.10	514.28
648	2356	431.00	0.00	36.10	514.28
649	2358	431.00	0.00	36.10	514.28
650	2360	430.00	0.00	36.53	514.28
651	2362	430.00	0.00	36.54	514.28
652	2364	430.00	0.00	46.97	538.35
653	2366	435.00	0.00	37.62	521.77
654	2368	436.00	0.00	36.60	520.43
655	2370	436.00	0.00	35.93	518.90
656	2372	438.00	0.00	34.83	518.35
657	2374	439.00	0.00	33.94	517.29
658	2376	438.00	317.22	34.38	517.31
659	2378	438.00	0.00	34.15	516.77
660	2380	440.00	0.00	33.39	517.02
661	2382	439.00	0.00	33.37	515.98
662	2384	438.00	0.00	33.66	515.66
663	2386	438.00	240.04	33.36	514.96
664	2388	444.00	0.00	31.49	516.64
665	2390	443.00	0.00	32.01	516.84
666	2392	443.00	0.00	32.02	516.86
667	2394	441.00	0.00	32.96	517.04
668	2396	439.00	0.00	32.93	514.97
669	2398	440.00	0.00	32.48	514.93
670	2400	441.00	0.00	31.89	514.56
671	2402	442.00	175.78	31.41	514.46
672	2404	446.00	0.00	29.64	514.38
673	2406	443.00	0.00	31.01	514.53
674	2408	442.00	0.00	31.67	515.06
675	2410	442.00	0.00	31.59	514.86
676	2412	443.00	0.00	31.06	514.65
677	2414	444.00	9.86	30.80	515.05
678	2416	445.00	4.08	30.08	514.39
679	2418	447.00	0.00	29.17	514.29
680	2420	446.00	0.00	29.60	514.27
681	2422	446.00	0.00	29.60	514.27
682	2424	441.00	0.00	32.49	515.94
683	2426	467.00	398.48	18.57	509.83
684	2428	471.00	0.00	16.82	509.80

H2ONET Customized Junction Report - 1998 Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Num)	OUTPUT: DEMAND (gpm)	OUTPUT: PRESSURE (psi)	OUTPUT: GRADE (ft)
685	2430	477.00	60.52	14.20	509.76
686	2432	463.00	0.00	20.40	510.06
687	2434	454.00	163.54	24.25	509.94
688	2436	465.00	0.00	19.56	510.12
689	2438	458.00	0.00	22.76	510.49
690	2440	460.00	0.00	21.79	510.28
691	2442	458.00	261.12	22.58	510.08
692	2444	456.00	0.00	24.16	511.74
693	2446	463.00	0.00	18.87	506.53
694	2448	467.00	199.92	12.04	494.77
695	2450	463.00	0.00	22.66	515.27
696	2452	460.00	206.72	21.94	510.61
697	2454	463.00	0.00	19.13	507.14
698	2456	461.00	0.00	20.33	507.90
699	2458	464.00	0.00	18.91	507.62
700	2460	465.00	0.00	18.39	507.42
701	2462	470.00	0.00	6.91	485.95
702	2464	470.00	0.00	3.61	478.32
703	2466	467.00	167.28	3.37	474.78
704	2468	471.00	0.00	1.46	474.36
705	2470	474.00	91.12	0.10	474.23
706	2472	475.00	0.00	-0.33	474.23
707	2474	470.00	0.00	1.92	474.43
708	2476	466.00	0.00	3.78	474.72
709	2478	468.00	0.00	10.23	491.59
710	2480	470.00	325.72	9.37	491.61
711	2482	463.00	0.00	24.61	519.78
712	2484	416.00	0.00	35.30	497.44
713	2486	416.00	0.00	35.29	497.41
714	2488	416.00	48.62	35.27	497.35
715	2490	416.00	0.00	35.27	497.35

H2ONET Customized Tank/Well Report - 1998 Peak Hour Demand

	TANK: ID (Char)	TANKHYD: ELEVATION (Num)	TANKHYD: DIAMETER (Num)	TANKHYD: INIT_LEVEL (Num)	TANKHYD: MAX_LEVEL (Num)	TANKHYD: MIN_LEVEL (Num)
1	1000	661.00	20.00	20.00	30.00	15.00
2	1002	572.00	128.00	25.00	32.00	15.00
3	1004	191.00				0.00
4	1006	246.00				0.00
5	1008	275.00				0.00
6	1028	212.00				0.00
7	1030	284.00				0.00
8	1032	269.00				0.00
9	1034	269.00				0.00
10	1036	305.00				0.00
11	1038	256.00				0.00
12	1040	247.00				0.00
13	1044	402.00				0.00
14	1046	262.00				0.00
15	1048	360.00				0.00
16	1052	277.00				0.00
17	1012	612.00	128.00	25.00	32.00	15.00
18	1026	361.00				0.00
19	1024	256.00				0.00
20	1018	380.00				0.00
21	1016	380.00				0.00
22	1014	376.00				0.00
23	1056	295.00				0.00
24	1058	369.00				0.00

H2ONET Customized Pump Report - 1998 Peak Hour Demand

	PUMP: ID (Char)	PUMPHYD: HIGH_FLOW (Num)	PUMPHYD: HIGH_HEAD (Num)	PUMPHYD: DSGN_FLOW (Num)	PUMPHYD: DSGN_HEAD (Num)	PUMPHYD: SHUT_HEAD (Num)
1	2002	1,200.00	300.00	1,000.00	345.00	425.00
2	2004	1,100.00	196.00	823.00	351.00	550.00
3	2006	800.00	160.00	550.00	310.00	440.00
4	2010	1,300.00	34.00	1,000.00	45.00	60.00
5	2012	0.00	0.00	200.00	100.00	
6	2014	5,600.00	60.00	4,000.00	140.00	210.00
7	2016	0.00	0.00	448.00	201.00	
8	2018	0.00	0.00	175.00	219.00	
9	2020	0.00	0.00	325.00	230.00	
10	2026	1,500.00	170.00	1,271.00	265.00	420.00
11	2028	0.00	0.00	291.00	248.00	
12	2030	2,000.00	220.00	1,426.00	364.00	500.00
13	2032	2,000.00	225.00	1,421.00	271.00	360.00
14	2034	800.00	200.00	538.00	324.00	500.00
15	2036	1,400.00	200.00	1,000.00	320.00	380.00
16	2038	800.00	145.00	509.00	254.00	320.00
17	2040	1,200.00	210.00	800.00	339.00	450.00
18	2042	1,000.00	250.00	783.00	318.00	500.00
19	2046	790.00	90.00	404.00	249.00	360.00
20	2048	800.00	248.00	643.00	319.00	460.00
21	2050	450.00	30.00	220.00	74.00	80.00
22	2052	0.00	0.00	469.00	283.00	
23	2056	500.00	153.00	374.00	298.00	440.00
24	2060	2,400.00	190.00	1,988.00	278.00	420.00
25	2062	0.00	0.00	463.00	205.00	

H2ONET Customized Valve Report - 1998 Peak Hour Demand

	VALVE: ID (Char)	VALVEHYD: DIAMETER (Num)	VALVEHYD: SETTING (Num)
1	3004	12.00	60.00
2	3006	4.00	50.00
3	3008	6.00	45.00
4	3010	4.00	51.00
5	3012	6.00	54.00
6	3016	8.00	50.00
7	3018	12.00	50.00
8	3020	6.00	52.00
9	3022	10.00	65.00
10	3024	6.00	60.00
11	3026	6.00	60.00
12	3028	8.00	53.00
13	3032	10.00	54.00
14	3034	8.00	53.00
15	3038	12.00	65.00

U.C. BERKELEY LIBRARIES



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